

# **ATTACHMENT A**

## **PROPOSED REGULATION ORDER**

**Title 13 California Code of Regulations**

## PROPOSED REGULATION ORDER

NOTE: This document is written in a style to indicate changes from the existing provisions. All existing language is indicated by plain text. All additions to language are indicated by underlined text. All deletions to language are indicated by ~~strikeout~~. Only those portions containing the suggested modifications from existing provisions are included. All other portions remain unchanged and are indicated by the symbol “\* \* \* \* \*” for reference.

Amend sections 2111, 2112, 2139, 2140, 2147, 2440, 2441, 2442, 2443.1, 2443.2, 2443.3, 2444, 2445.1, 2445.2, 2446, and 2471, and adopt section 2444.2, title 13 California Code of Regulations, and amend Appendix A to article 2.1, chapter 2 division 3, title 13, California Code of Regulations, to read as follows:

### § 2111. Applicability.

(a) These procedures shall apply to:

(1) California-certified 1982 and subsequent model-year passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, motorcycles, and California-certified 1997 and subsequent model-year off-road motorcycles and all-terrain vehicles, including those federally certified vehicles which are sold in California pursuant to Health and Safety Code section 43102,

(2) California-certified motor vehicle engines used in such vehicles, ~~and~~

(3) California-certified 2000 and subsequent model-year off-road compression-ignition engines, ~~and~~ and

(4) California-certified 2009 and subsequent model-year spark-ignition sterndrive and inboard marine engines.

\* \* \* \* \*

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018 and 43105, Health and Safety Code.

Reference: Sections 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5, Health and Safety Code.

**§ 2112. Definitions.**

\* \* \* \* \*

(l) "Useful life" means, for the purposes of this article:

\* \* \* \* \*

(23) For 2009 and subsequent model year spark-ignition sterndrive and inboard marine engines, a period of ten years or 480 hours, whichever first occurs.

\* \* \* \* \*

**Appendix A  
to Article 2.1**

California In-Use Vehicle Emission-Related Recall Procedures, Enforcement Test Procedures, and Failure Reporting Procedures for 1982 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Engines, Motorcycles, 1997 and Subsequent Model-Year Off-Road Motorcycles and All-Terrain Vehicles, ~~and 2000 and Subsequent Model-Year Off-Road Compression-Ignition Engines, and 2009 and Subsequent Model-Year Spark-Ignition Sterndrive and Inboard Marine Engines.~~

\* \* \* \* \*

I. Passenger Car, Light-Duty Truck, Medium-Duty Vehicle, ~~and Motorcycle, and Sterndrive and Inboard~~ Parameters and Specifications.

\* \* \* \* \*

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104, and 43105, Health and Safety Code.

Reference: Sections 39002, 39003, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, and 43204-43205.5, Health and Safety Code.

## § 2139. Testing.

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(h) For spark-ignition sterndrive and inboard marine engines, in-use compliance tests shall be performed pursuant to section 2442, Title 13, California Code of Regulations. The in-use compliance testing shall use the same test procedure utilized for the specific engine's original certification testing.

(hi) For any emission in-use compliance test performed pursuant to subsections (a) through (gh), the ARB may waive a specific test for subsequent vehicle samples if results from vehicle samples already tested are deemed sufficient to establish complying emission levels. The ARB shall inform the manufacturer at least 30 days prior to enforcement testing of its vehicles or engines and shall permit a manufacturer representative to observe the enforcement testing.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code.

Reference: Sections 39002, 39003, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43103, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213 Health and Safety Code.

## § 2140. Notification and Use of Test Results.

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(b) If the results of the in-use vehicle emission tests conducted pursuant to Section 2139 indicate that the average emissions of the test vehicles for any pollutant exceed the applicable emission standards specified in Title 13, California Code of Regulations, Sections 1960.1, 1961, 1956.8, 1958, 2412, ~~or 2423~~ or 2442, the entire vehicle population so represented shall be deemed to exceed such standards. The Executive Officer shall notify the manufacturer of the test results and upon receipt of the notification, the manufacturer shall have 45 days to submit an influenced recall plan in accordance with Sections 2113 through 2121, Title 13, California Code of Regulations. If no such recall plan is submitted, the Executive Officer may order corrective action including recall of the affected vehicles in accordance with Sections 2122 through 2135, Title 13, California Code of Regulations.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018 and 43105, Health and Safety Code.

Reference: Sections 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5 and 43211-43213, Health and Safety Code.

#### **§ 2147. Demonstration of Compliance with Emission Standards.**

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(b) A manufacturer may test properly maintained in-use vehicles with the failed emission-related component pursuant to the applicable certification emission tests specified in Title 13, California Code of Regulations, Section 1960.1 or 1961, as applicable, for passenger cars, light-duty trucks and medium-duty vehicles, Section 1956.8 for heavy-duty engines and vehicles, and Section 1958 for motorcycles, and Section 2442 for inboard and sterndrive marine engines. The emissions shall be projected to the end of the vehicle's or engine's useful life using in-use deterioration factors. The in-use deterioration factors shall be chosen by the manufacturer from among the following:

\* \* \* \* \*

NOTE: Authority cited: Sections 39600, 39601, and 43105, Health and Safety Code.

Reference: Sections 43000, 43009.5, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code.

#### **§ 2440. Applicability.**

(a)(1) This article applies to model year 2001 and ~~later subsequent model year~~ spark-ignition marine engines ~~used to propel marine watercraft~~, unless otherwise indicated.

~~(2) Sterndrive and inboard engines are exempt from this article.~~

~~(2)(3)~~ Every new spark-ignition marine engine that is manufactured for sale, sold, or offered for sale in California, or that is introduced, delivered or imported into California for introduction into commerce, and which is subject to any of the standards prescribed in this article must be covered by an Executive Order, issued pursuant to this article.

(3) Spark-ignition sterndrive and inboard marine engines produced by the engine manufacturer specifically for competition are exempt from the requirements of this article, except section 2443.1, provided that the marine watercraft in which the engine is installed is designed, built, and used solely for competition. Marine watercraft not registered with a nationally-recognized organization that sanctions professional competitive events or used for amateur or occasional competition do not meet the competition exemption criteria.

(b) Each part of this article is severable, and in the event that any part of this chapter is held to be invalid, the remainder of this article remains in full force and effect.

(c)(1) For purposes of this article, military tactical vehicles or equipment means vehicles or equipment owned by the U.S. Department of Defense and/or the U.S. military services and used in combat, combat support, combat service support, tactical or relief operations, or training for such operations.

(2) This article shall not apply to engines used in off-road military tactical vehicles or equipment which have been exempted from regulations under the federal national security exemption, 40 CFR, subpart J, section 90.908, which is incorporated by reference herein. It shall also not apply to those vehicles and equipment covered by the definition of military tactical vehicle that are commercially available and for which a federal certificate of conformity has been issued under 40 CFR Part 91, subpart B, which is incorporated by reference herein.

(3) The U.S. Department of Defense shall submit to the ARB a list of all vehicles and equipment that are exempted under the above provisions and which are located in the State of California. If any additional vehicle and equipment types are added to the list during any calendar year, the U.S. Department of Defense shall update the list and submit it to the ARB by January 1 of the following year.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

#### **§ 2441. Definitions.**

(a) Definitions in section 1900(b), Division 3, Chapter 9, Title 13 of the California Code of Regulations, apply with the following additions:

(1) “Abuse” means incorrect or improper operation of an engine or equipment unit that results in the failure of an emission-related part.

(2) “Acceptable quality level” (AQL) means the maximum percentage of failing engines that can be considered a satisfactory process average for sampling inspections.

(3) “ARB Enforcement Officer” means any officer or employee of the Air Resources Board so designated in writing by the Executive Officer or by the Executive Officer’s designee.

(4) “Base Fuel Schedule” refers to the fuel calibration schedule programmed into the Engine Control Module or PROM when manufactured or when updated by some off-board source, prior to any learned on-board correction.

(5) “Calculated load value” (CLV) refers to an indication of the current airflow divided by peak airflow, where peak airflow is corrected for altitude, if available. This definition provides a unitless number that is not engine specific, and provides the service technician with an indication of the percent engine capacity that is being used (with wide open throttle as 100%). See equation below:

$$CLV = \left( \frac{\text{Current airflow}}{\text{Peak airflow (at sea level)}} \times \frac{\text{Atmospheric pressure (at sea level)}}{\text{Barometric pressure}} \right)$$

~~(4)~~(6) “Capture rate” means the percentage of in-use engines subject to recall which must be corrected to bring the class of engines into compliance. The number of engines subject to recall shall be based on the actual number of engines in use as verified by engine registration records compiled and prepared by industry, or a comparable source as determined by the Executive Officer at the time a recall is initiated.

~~(5)~~(7) “Carryover engine family” means an engine family that undergoes certification using carryover test data from previous model years.

~~(6)~~(8) “Certification” means, with respect to new spark-ignition marine engines, obtaining an Executive Order for an engine family complying with the spark-ignition marine engine exhaust emission standards and requirements specified in Title 13, California Code of Regulations, sections 2442 and 2447.

~~(7)~~(9) "Complete engine assembly" or "complete engine configuration" means an assembly of a basic engine and all of the specific applicable components (e.g., air inlet, fuel and exhaust systems, etc.) and calibrations (e.g., carburetor jet size, valve timing, etc.) required for the assembly to be installed in a new unit of equipment.

(10) "Continuous monitoring" means sampling at a rate no less than two samples per second. If for engine control purposes, a computer input component is sampled less frequently, the value of the component may instead be evaluated each time sampling occurs.

~~(8)~~(11) "Emission control system" means any device, system, or element of design that controls or reduces the emission of substances from an engine.

~~(9)~~(12) "Enforcement test results" means data or information gathered through enforcement programs conducted by the Air Resources Board. These programs include, but are not limited to, field inspections, in-use compliance testing, assembly-line testing.

~~(40)~~(13) "Engine family" means a subclass of a basic engine based on similar emission characteristics. The engine family is the grouping of engines that is used for the purposes of certification.

~~(44)~~(14) "Engine identification number" means a unique specification (for example, model number/serial number combination) that allows each spark-ignition marine engine to be distinguished from other similar engines.

(15) "Engine misfire" means lack of combustion in the cylinder due to absence of spark, poor fuel metering, poor compression, or any other cause.

(16) "Engine start" is defined as the point at which normal, synchronized spark and fuel control is obtained or when the engine reaches a speed 150 revolutions per minute (rpm) below the normal, warmed-up idle speed.

~~(42)~~(17) "Exhaust emissions" means matter emitted into the environment from any opening downstream from the exhaust port of a spark-ignition marine engine.

~~(43)~~(18) "Executive Officer" means the Executive Officer of the Air Resources Board or his or her authorized representative.



~~(14)~~(19) "Executive Order" means an order issued by the Executive Officer certifying engines for sale in California.

~~(15)~~(20) "Family Emission Limit" means an emission value assigned by a marine engine manufacturer to an engine family for the purpose of complying with a corporate average exhaust emission standard. The Family Emission Limit (FEL) must not exceed the limit specified in this Article.

~~(16)~~(21) "Fuel system" means all components involved in the transport, metering, and mixture of the fuel from the fuel tank to the combustion chamber(s) including, but not limited to the following: fuel tank, fuel tank cap, fuel pump, fuel lines, oil injection metering system, carburetor or fuel injection components, and all fuel system vents.

(22) "Fuel trim" refers to feedback adjustments to the base fuel schedule. Short-term fuel trim refers to dynamic or instantaneous adjustments. Long-term fuel trim refers to much more gradual adjustments to the fuel calibration schedule than short-term trim adjustments. These long-term adjustments compensate for engine differences and gradual changes that occur over time.

(23) "Functional check" for an output component means verification of proper response to a computer command. For an input component, functional check means verification of the input signal being in the range of normal operation, including evaluation of the signal's rationality in comparison to all available information.

~~(17)~~(24) "Inboard Engine" means a ~~four-stroke~~ spark-ignition marine engine not used in a personal watercraft that is designed such that the propeller shaft penetrates the hull of the marine watercraft while the engine and the remainder of the drive unit is internal to the hull of the marine watercraft.

~~(18)~~(25) "Inspection criteria" means the pass and fail numbers associated with a particular sampling plan.

(26) "Malfunction" means the inability of an emission-related component or system to remain within design specifications. Further, malfunction refers to the deterioration of any of the above components or systems to a degree that would likely cause the emissions of an aged engine with the deteriorated components or systems present at the beginning of the applicable certification emission test to exceed the HC+NO<sub>x</sub> emission standard by more than 50 percent, unless otherwise specified, as applicable pursuant to Subchapter 1 (commencing with Section 1900), Chapter 3 of Title 13.

~~(19)~~(27) "Marine engine manufacturer" means any person engaged in the manufacturing or assembling of new spark-ignition marine engines or the importing of such engines for resale, or who acts for and is under the control of any such person in connection with the distribution of such engines. A spark-ignition marine engine manufacturer does not include any dealer with respect to new spark-ignition marine engines received by such person in commerce.

~~(20)~~(28) "Marine watercraft" means every description of boat, ship or other artificial contrivance used, or capable of being operated on water.

~~(21)~~(29) "Model year" means the engine manufacturer's annual new model production period which includes January 1 of the calendar year for which the model year is named, ends no later than December 31 of the calendar year, and does not begin earlier than January 2 of the previous calendar year. Where an engine manufacturer has no annual new model production period, model year means the calendar year.

~~(22)~~(30) "New", for purposes of this Article, means a spark-ignition marine engine or watercraft the equitable or legal title to which has never been transferred to an ultimate purchaser. Where the equitable or legal title to the engine or watercraft is not transferred to an ultimate purchaser until after the engine or watercraft is placed into service, then the engine or watercraft will no longer be new after it is placed into service. A spark-ignition marine engine or watercraft is placed into service when it is used for its functional purposes. With respect to imported spark-ignition marine engines or watercraft, the term "Anew" means an engine or watercraft that is not covered by an Executive Order issued under this Article at the time of importation, and that is manufactured after the effective date of a section in this Article which is applicable to such engine or watercraft, or which would be applicable to such engine or watercraft had it been manufactured for importation into the United States.

~~(23)~~(31) "Nonconformity" or "Noncompliance", for purposes of Title 13, California Code of Regulations, section 2444, means that:

(A) a significant number, determined by the Executive Officer, of a class of engines, although properly maintained and used, experience a failure of the same emission-related component(s) within their useful lives which, if uncorrected, results in the engines' failure to comply with the emission standards prescribed under section 2442 which are applicable to the model year of such engines; or

(B) a class of engines that at any time within their useful lives, although properly maintained and used, on average does not comply with the emission standards prescribed under section 2442 which are applicable to the model year of such engines.

(32) "Operating cycle" consists of engine startup, engine run, and engine shutoff.

~~(24)~~(33) "Original equipment manufacturer" means a manufacturer who purchases engines for installation in its equipment for sale to ultimate purchasers.

~~(25)~~(34) "Outboard engine" means a spark-ignition marine engine that, when properly mounted on a marine watercraft in the position to operate, houses the engine and drive unit external to the hull of the marine watercraft.

~~(26)~~(35) "Personal watercraft engine" means a spark-ignition marine engine that does not meet the definition of outboard engine, inboard engine or sterndrive engine, except that the Executive Officer may, in his or her discretion, ~~may~~ classify a personal watercraft engine as an inboard or sterndrive engine if it is comparable in technology and emissions to an inboard or sterndrive engine.

~~(27)~~(36) "Production-line tests" are emission tests performed on a sample of production engines produced for sale in California and conducted in accordance with Title 13, California Code of Regulations, section 2446(a).

(37) "Redline engine speed" means the engine manufacturer recommended maximum engine speed as normally displayed on instrument panel tachometers, or the engine speed at which fuel shutoff occurs.

(38) "Response rate," with regards to oxygen sensors, refers to the delay (measured in milliseconds) between a switch of the sensor from lean to rich or vice versa in response to a change in fuel/air ratio above and below stoichiometric.

~~(28)~~(39) "Sales" or "Eligible sales" means the actual or calculated sales of an engine family in California for the purposes of corporate averaging and production-line testing. Upon Executive Officer approval, an engine manufacturer may calculate its eligible sales through market analysis of actual federal production or sales volumes.

~~(29)~~(40) "Scheduled maintenance" means any adjustment, repair, removal, disassembly, cleaning, or replacement of components or systems required by the engine manufacturer to be performed on a periodic basis to prevent part failure or marine watercraft or engine malfunction, or those actions anticipated as necessary to correct an overt indication of malfunction or failure for which periodic maintenance is not appropriate.

(41) "Small volume manufacturer" means a marine engine manufacturer with spark-ignition marine engine sales less than 2,000 per year in the United States. It is the responsibility of the manufacturer to document the sales rate to the Executive Officer.

~~(30)~~(42) "Spark-ignition marine engine" means any engine used to propel a marine watercraft, and which utilizes the spark-ignition combustion cycle; including, but not limited to personal watercraft, outboard, inboard and sterndrive engines.

~~(31)~~(43) "Sterndrive engine" means a ~~four-stroke~~ spark-ignition marine engine not used in a personal watercraft that is designed such that the drive unit is external to the hull of the marine watercraft, while the engine is internal to the hull of the marine watercraft.

~~(32)~~(44) "Test engine" means the engine or group of engines that an engine manufacturer uses during certification, production-line and in-use testing to determine compliance with emission standards.

(45) "Test Procedures" means the document entitled "California Exhaust Emission Standards and Test Procedures for 2001 Model Year and Later Spark-Ignition Marine Engines," which includes the standards and test procedures applicable to 2001 and later spark-ignition personal watercraft, outboard, inboard and sterndrive marine engines, as adopted October 21, 1999 and as amended (insert date of amendment). This document is incorporated by reference herein.

~~(33)~~(46) "Ultimate purchaser" means, with respect to any new spark-ignition marine engine, the first person who in good faith purchases such new spark-ignition marine engine for purposes other than resale.

~~(34)~~(47) "U.S.C." means United States Code.

(48) "Used solely for competition" means exhibiting features that are not easily removed and that would render its use other than in competition unsafe, impractical, or highly unlikely.

~~(35)~~(49) "Useful life" for spark-ignition marine engines means nine years for personal watercraft engines and sixteen years for an outboard, engine sterndrive, and inboard engines.

(50) "Warm-up cycle" means sufficient engine operation such that the coolant temperature has risen by at least 40 degrees Fahrenheit from engine starting and reaches a minimum temperature of at least 160 degrees Fahrenheit.

~~(36)~~(51) "Warranty period" means the period of time the engine or part is covered by the warranty provisions.

~~(37)~~(52) "Warranty station" means any dealer, service center or other agent that is authorized by the engine manufacturer to perform diagnostic labor, repairs or replacements of warranted engine components.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

## **§ 2442. Emission Standards.**

(a) Model year 2001 and later model year spark-ignition personal watercraft and outboard marine engines:

(1) Exhaust emissions from new spark-ignition marine engines manufactured for sale, sold, or offered for sale in California, or that are introduced, delivered or imported into California for introduction into commerce must not exceed the hydrocarbon plus oxides of nitrogen (HC+NO<sub>x</sub>) exhaust emission standards listed in Table 1 during its designated useful life:

**Table 1.**

<b>Corporate Average Emission Standards by Implementation Date HC+NO<sub>x</sub> (g/kW-hr)</b>			
<b>Model Year</b>	<b>Max. Family Emission Limit (FEL)</b>	<b>P<sub>tx</sub> &lt; 4.3 kW</b>	<b>P<sub>tx</sub> ≥ 4.3 kW</b>
2001- <u>2003</u>	Not Applicable	81.00	$(0.25 \times (151+557/P_{tx}^{0.9})) + 6.0$
2004- <u>2007</u>	80	64.80	$(0.20 \times (151+557/P_{tx}^{0.9})) + 4.8$
2008 <u>and Later</u>	44	30.00	$(0.09 \times (151+557/P_{tx}^{0.9})) + 2.1$

where:

P<sub>tx</sub> is the average power in kilowatts (kW) (sales-weighted) of the total number of spark-ignition marine engines produced for sale in California in model year x. Engine power must be calculated using the Society of Automotive Engineers (SAE) standard J1228, November 1991, incorporated herein by reference. Engine manufacturers must not determine P<sub>tx</sub> by combining the power outputs of outboard engines with the power outputs of personal watercraft engines.

~~(b)(2)~~ An engine manufacturer may comply with the standards directly on an individual engine family basis. Consequently in Table 1, FELs are not applicable for any model year and P<sub>tx</sub> means the average power in kW (sales-weighted) of the subject engine family produced for sale in California in model year x.

Compliance with the standards on a corporate average basis is determined as follows:

$$\frac{\sum_{j=1}^n (PROD_{jx})(FEL_{jx})(P_{jx})}{\sum_{j=1}^n (PROD_{jx})(P_{jx})} = STD_{ca}$$

where:

$n$  = ~~t~~I Total number of engine families (by category)

$PROD_{jx}$  = ~~n~~N Number of units each engine family  $j$  produced for sale in California in model year  $x$ .

$FEL_{jx}$  = ~~t~~The Family Emission Limit (FEL) for engine family  $j$  in model year  $x$ , which must be determined by the engine manufacturer subject to the following conditions: (1) no individual engine family FEL shall exceed the maximum allowed value as specified in Table 1; (2) no engine family designation or FEL shall be amended in a model year unless the engine family is recertified; and (3) prior to sale or offering for sale in California, each engine family must be certified in accordance with the test procedures referenced in section 2447 and must meet the engine manufacturer's FEL as a condition of the Executive Order. Before certification, the engine manufacturer must also submit estimated production volumes for each engine family to be offered for sale in California.

$P_{jx}$  = The average power in kW (sales-weighted) of engine family  $j$  produced for sale in California in model year  $x$ . Engine power must be calculated using SAE standard J1228, November 1991, incorporated herein by reference.

$STD_{ca}$  = An engine manufacturer's calculated corporate average HC+NO<sub>x</sub> exhaust emissions from those California spark-ignition marine engines subject to the California corporate average HC+NO<sub>x</sub> exhaust emission standard determined from Table 1, as established by an Executive Order certifying the California production for the model year. This Executive Order must be obtained prior to the issuance of certification Executive Orders for individual engine families for the model year.

~~(1)~~(A) For purposes of compliance under this paragraph, engine manufacturers must not corporate average outboard engine families in combination with personal watercraft engine families.

~~(2)~~(B) During the engine manufacturer's production year, for each engine family, the engine manufacturer shall provide the Executive Officer within 45 days after the last day in each calendar quarter the total number of spark-ignition marine engines produced for sale in California and their applicable FEL(s).

~~(3)~~(C) The Executive Order certifying the California production for a model year must be obtained prior to the issuance of certification Executive Orders for individual engine families for the model year.

~~(4)~~(D) The engine manufacturer's average HC+NO<sub>x</sub> exhaust emissions must meet the corporate average standard at the end of the engine manufacturer's production for the model year. At the end of the model year, the manufacturer must calculate a corrected corporate average using sales or eligible sales rather than projected sales.

~~(5)~~(E) Production and sale of spark-ignition marine engines that result in noncompliance with the California standard for the model year shall cause an engine manufacturer to be subject to: revocation or suspension of Executive Orders for the applicable engine families; enjoinder from any further sales, or distribution, of such noncompliant engine families, in the State of California pursuant to section 43017 of the Health and Safety Code; and all other remedies available under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the engine manufacturer, the Executive Officer will consider any information provided by the equipment manufacturer.

~~(6)~~(F) For each model, the engine manufacturer shall submit California sales data ninety (90) days after the end of the model year.

(b) Exhaust emissions from new model year 2003 and later spark-ignition sterndrive and inboard marine engines must not exceed the exhaust emission standards listed in Table 2 or Table 3, as applicable, for the designated emission durability test period.



**Table 2.**

<b><u>Inboard and Sterndrive Exhaust Emission Standards (by Implementation Date)</u></b>		
<b><u>Model Year</u></b>	<b><u>HC+NO<sub>x</sub></u> (grams per kilowatt-hour)</b>	<b><u>Durability Test Period</u> (hours)</b>
<u>2003-2008<sup>1</sup></u>	<u>15.0<sup>2</sup></u>	<u>—</u>
<u>2007 and Later<sup>3, 4</sup></u>	<u>5.0</u>	<u>480</u>

1. Engines with a maximum rated power exceeding 373 kilowatts (500 horsepower) are not required to comply with these standards.
2. Compliance to the HC+NO<sub>x</sub> standard may be averaged on a sales-weighted basis, across the engine manufacturers' California production.
3. For model year 2007, engine manufacturers shall certify a minimum of 10% of their California production to the 2009 model year emission standards and other requirements.
4. For model year 2008, engine manufacturers shall certify a minimum of 50% of their California production to the 2009 model year emission standards and other requirements.

**Table 3.**

<b><u>Small Volume Manufacturers Inboard and Sterndrive Exhaust Emission Standards</u></b>		
<b><u>Model Year</u></b>	<b><u>HC+NO<sub>x</sub></u> (grams per kilowatt-hour)</b>	<b><u>Durability Test Period</u> (hours)</b>
<u>2009 and Later</u>	<u>5.0</u>	<u>480</u>

(1) No crankcase emissions shall be discharged into the ambient atmosphere from 2003 and later spark-ignition sterndrive and inboard marine engines.

(2) Production and sale of spark-ignition marine engines that result in noncompliance with the California standard for the model year shall cause an engine manufacturer to be subject to: revocation or suspension of Executive Orders for the applicable engine families; injunction from any further sales, or distribution, of such noncompliant engine families, in the State of California pursuant to section 43017 of the Health and Safety Code; and all other remedies available under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the engine manufacturer, the Executive Officer will consider any information provided by the equipment manufacturer.

(3) For each engine family, the engine manufacturer shall submit California sales data ninety (90) days after the end of the model year.

(c) The test equipment and test procedures for determining compliance with these standards are set forth in Parts III and IV, respectively, of the ~~“California Exhaust Emission Standards and Test Procedures for 2001 and Later Spark-Ignition Marine Engines” (“Test Procedures.”), adopted October 21, 1999, which are incorporated by reference herein.~~

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

**§ 2443.1. Emission Control Labels – Model Year 2001 and Later Spark-Ignition Marine Engines.**

(a) Purpose. The Air Resources Board recognizes that certain emissions-critical or emissions-related parts must be properly identified and maintained to ensure that engines meet the applicable emission standards. The purpose of this section is to require engine manufacturers to affix a label (or labels) on each production engine (or watercraft, as applicable) to provide the engine owner and service mechanic with information necessary for the proper maintenance of these parts in customer use. These specifications also require the engine manufacturer to permanently identify the engine with a unique identification number that will be used for enforcement purposes, including in-use testing.

(b) Applicability. This section applies to:

(1) Model year 2001 and later spark-ignition personal watercraft and outboard marine engines and model year 2003 and later spark-ignition sterndrive and inboard marine engines, which have been certified to the applicable emission standards pursuant to Health and Safety Code section 43013;

(2) Engine manufacturers and original equipment manufacturers, as applicable, that have certified such engines; and

(3) Original equipment manufacturers, regardless of whether they have certified the engine, if their equipment obscures the emission control labels of such certified engines.

(c) Engine Label and Location.

(1) A legible label must be welded, riveted or otherwise permanently attached by the engine manufacturer to an area of the engine (e.g., block or crankcase) in such a way that it will be readily visible to the average person after installation of the engine in the watercraft. If such an attachment is not feasible, the Executive Officer may allow the label to be attached on components of the engine or watercraft assembly (as applicable) that satisfy the requirements of Subsection (c)(2). Such labels must be attached on all complete engine assemblies that are produced by an engine manufacturer.

(2) In selecting an acceptable location, the engine manufacturer must consider the possibility of accidental damage (e.g., possibility of tools or sharp instruments coming in contact with the label). Each engine label must be affixed in such a manner that it cannot be removed without destroying or defacing the label, and must not be affixed to any engine (or watercraft, as applicable) part that is likely to be replaced during the engine's (or watercraft's, as applicable) useful life or that is not integral to the engine's operation. The engine label must not be affixed to any engine (or watercraft as applicable) component that is easily detached from the engine. If the engine manufacturer claims there is inadequate space to attach the label, the Executive Officer will determine a suitable location.

(3) The engine label information must be written in the English language and use block letters (i.e., sans serif, uppercase characters) except for units of measurement, which may be sans serif, lower-case characters. The characters must be of a color that contrasts with the background of the label.

(4) The engine label must contain the following information:

(A) The heading **"EMISSION CONTROL INFORMATION."**

(B) The full corporate name or trademark of the engine manufacturer.

(i) An engine manufacturer may request the Executive Officer's approval to delete its name and trademark, and substitute the name and trademark of another engine manufacturer, original equipment manufacturer or third-party distributor.

(ii) Approval under paragraph (4)(B)(i) above does not relieve the engine manufacturer granted an engine family Executive Order of any requirements imposed by these provisions on the applicable engines.

(C) The statement, “**THIS (WATERCRAFT’S ENGINE or ENGINE,** as applicable) **IS CERTIFIED TO OPERATE ON** (specify operating fuel(s)).”

(D) Identification of the Exhaust Emission Control System (Abbreviations may be used and must conform to the nomenclature and abbreviations provided in the latest revision of the Society of Automotive Engineer’s (SAE) procedure J1930, “Electrical/Electronic Systems Diagnostic Terms, Definitions, Abbreviations and Acronyms”, and as specified in section 1977, Title 13, California Code of Regulations.

(E) Any specific fuel or engine lubricant requirements (e.g., fuel-oil ratio(s), lead content, research octane number, engine lubricant type).

(F) Date of manufacture (day (optional), month and year).

(G) An unconditional statement of compliance with the appropriate model year California regulations. For example, “**THIS ENGINE CONFORMS TO** (model year) **CALIFORNIA EMISSION REGULATIONS FOR SPARK-IGNITION MARINE ENGINES.**” For an engine family certified in California with an FEL different from the FEL assigned federally for the engine family, the following statement shall be appended to the unconditional statement of compliance: **AND IS CERTIFIED TO** (specify FEL) **g/kW-hr HC+NO<sub>x</sub> ENGINE FAMILY EXHAUST EMISSION STANDARD IN CALIFORNIA.**”

(H) The engine family identification (i.e., engine family name). The engine family identification shall be in accordance with the current format used by the United States Environmental Protection Agency.

(I) Engine displacement (in cubic centimeters, cubic inches, or liters) of the individual engine upon which the engine label is affixed.

(J) The maintenance specifications and adjustments recommended by the engine manufacturer, including, as applicable: valve lash, ignition timing, idle air/fuel setting procedure and value (e.g., idle speed drop), high idle speed and spark plug gap. These specifications must indicate the proper transmission position, if applicable, during tune-up and what accessories, if any, should be in operation, and what systems, if any (e.g., vacuum advance, battery, air pump), should be disconnected during the tune-up. If the engine manufacturer does not recommend adjustment of the foregoing specifications, the engine manufacturer may substitute in lieu of the specifications, the single statement, **"NO OTHER ADJUSTMENTS NEEDED."** For all engines, the instructions for tune-up adjustments must be sufficiently clear on the engine label to preclude the need for a mechanic or equipment operator to refer to another document in order to correctly perform the adjustments.

(5) If there is insufficient space on the engine to accommodate an engine label that contains all of the information in Subsection (4) above, the Executive eOfficer may allow the engine manufacturer to modify the engine label in one or more of the following ways:

(A) Exclude the information required in Subsections (4)(C), (D) and (E) from the engine label. This information must be specified elsewhere on the engine, or in the owner's manual.

(B) Substitute the information required in Subsection (4)(J) with the statement, **"REFER TO THE OWNER'S MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS."** When such a statement is used, the information required by Subsection (4)(J) must be specified in the owner's manual.

(C) Exclude the information required by Subsection (4)(F) on the engine label if the date the engine was manufactured is stamped or labeled permanently on the engine (e.g., within the serial number), and this date is readily visible.

(d) For Sterndrive and Inboard Engines used solely for Competition.

Engines manufactured solely for use in sanctioned competition are not required to comply with the emission standards and other requirements. Manufacturers may incorporate the engine label to identify the engines as produced for competition according to the provisions in this subsection.

(1) A legible label must be welded, riveted or otherwise permanently attached by the engine manufacturer to an area of the engine (e.g., block or crankcase) in such a way that it will be readily visible to the average

person after installation of the engine in the watercraft. If such an attachment is not feasible, the Executive Officer may allow the label to be attached on components of the engine or watercraft assembly (as applicable) that satisfy the requirements of Subsection (d)(2). Such labels must be attached on all complete engine assemblies that are produced by an engine manufacturer.

(2) In selecting an acceptable location, the engine manufacturer must consider the possibility of accidental damage (e.g., possibility of tools or sharp instruments coming in contact with the label). Each engine label must be affixed in such a manner that it cannot be removed without destroying or defacing the label, and must not be affixed to any engine (or watercraft, as applicable) part that is likely to be replaced during the engine's (or watercraft's, as applicable) useful life or that is not integral to the engine's operation. The engine label must not be affixed to any engine (or watercraft as applicable) component that is easily detached from the engine. If the engine manufacturer claims there is inadequate space to attach the label, the Executive Officer will determine a suitable location.

(3) The engine label information must be written in the English language and use block letters (i.e., sans serif, uppercase characters) except for units of measurement, which may be sans serif, lower-case characters. The characters must be of a color that contrasts with the background of the label.

(4) The engine label must contain the following information:

(A) The heading "**EMISSION CONTROL INFORMATION.**"

(B) The full corporate name or trademark of the engine manufacturer.

(i) An engine manufacturer may request the Executive Officer's approval to delete its name and trademark, and substitute the name and trademark of another engine manufacturer, original equipment manufacturer or third-party distributor.

(ii) Approval under paragraph (4)(B)(i) above does not relieve the engine manufacturer granted an engine family Executive Order of any requirements imposed by these provisions on the applicable engines.

(C) Date of manufacture (day (optional), month and year).

(D) An unconditional statement of noncompliance with the appropriate model year California regulations. For example, **“THIS ENGINE DOES NOT CONFORM TO (model year) CALIFORNIA EMISSION REGULATIONS FOR SPARK-IGNITION MARINE ENGINES AND MAY NOT BE INSTALLED ON A BOAT FOR ANY PURPOSE OTHER THAN COMPETITION.”**

(E) Engine displacement (in cubic centimeters, cubic inches, or liters) of the individual engine upon which the engine label is affixed.

~~(de)~~ An engine label may state that such engine conforms to any other applicable state or federal emission standards for new spark-ignition marine engines, or any other information that the engine manufacturer deems necessary for, or useful to, the proper operation and satisfactory performance of the engine.

~~(ef)~~ Engine identification number. Each engine must have a legible, unique engine identification number permanently affixed to or engraved on the engine.

~~(fg)~~ Supplemental Engine Label Content and Location.

(1) When a final engine, equipment, or watercraft assembly that is marketed to any ultimate purchaser is manufactured and the engine label affixed by the engine manufacturer is not readily visible, the manufacturer of the final engine, equipment or watercraft assembly (i.e., original equipment manufacturer) must affix a supplemental engine label upon the engine, equipment or watercraft. The supplemental label must be made of plastic or metal, and must be welded, riveted or otherwise affixed permanently to an area of the engine, equipment or watercraft so as to be readily visible.

(2) The original equipment manufacturer required to affix a supplemental label must consider the possibility of accidental damage to the supplemental engine label in the determination of the label location. Such a label must not be attached to any engine, equipment or watercraft component that is likely to be replaced during the useful life of the engine, equipment or watercraft (as applicable), and/or is not integral to the engine's operation. Such a label must not be attached to any engine or equipment component that is easily detached from the engine, equipment or watercraft (as applicable).

(3) The supplemental engine label must conform to the engine label requirements in Subsections (c)(3) and (4), except that the date of manufacture specified in Subsection (c)(4)(F) may be deleted from the supplemental engine label. When the date of engine manufacture does not appear on the supplemental engine label, the responsible original equipment manufacturer must display (e.g., label, stamp, etc.) the date elsewhere on the engine, equipment or watercraft so as to be readily visible. The original equipment manufacturer must also display the engine identification number elsewhere on the engine that is readily visible if the original number is obscured by the equipment manufacturer's equipment.

(gh) As used in ~~these~~this section, readily visible means that a label is readable by an average person from a distance of 46 centimeters (18 inches) without any obstructions from equipment, watercraft or engine parts (including all engine manufacturer or original equipment manufacturer (as applicable) available optional equipment) except for flexible parts (e.g., vacuum hoses, ignition wires) that can be moved out of the way without disconnection. Alternatively, the label and engine identification information required by these specifications must be no smaller than two (2) millimeters in height (with the exception of units of measurement) provided that no equipment or engine parts (including all engine manufacturer available optional equipment), except for flexible parts, obstruct the label(s).

(hi) The label(s), engine identification number(s) and any adhesives used must be designed to withstand, for the engine's or watercraft's useful life, typical environmental conditions in the area where the label(s) required by this section are affixed. Typical equipment environmental conditions include, but are not limited to, exposure to extreme heat or cold, engine fuels, lubricants and coolants (e.g., gasoline, motor oil, saltwater, ethylene glycol). The engine manufacturer must submit, with its certification application, a statement attesting that its labels and engine identification numbers comply with these requirements.

(ij) The engine manufacturer must obtain approval from the Executive Officer for all label and engine identification number formats and locations in conjunction with the engine family certification. Approval of specific maintenance settings on labels is not required; however, the format for all such settings and tolerances, if any, is subject to review. If the Executive Officer finds that the information on the label or engine identification number is vague or subject to misinterpretation, or that the location does not comply with these specifications, the Executive Officer may require that the label(s), engine identification number(s) or location(s) be modified accordingly.



(~~j~~k) Samples of all actual production labels used within an engine family must be submitted to the Executive Officer within thirty days after the start of production. Engine manufacturers must provide samples of their own applicable production labels, and samples of applicable production original equipment manufacturer labels that are accessible to the engine manufacturers due to the direct market arrangement between such manufacturers.

(~~k~~l) The Executive Officer may approve alternate label and engine identification number locations. The Executive Officer may also, upon request, waive or modify the label content requirements provided that the intent of this section is met.

(~~m~~n)(1) If the Executive Officer finds any engine manufacturer using labels and engine identification numbers that are different from those approved or do not substantially comply with the readability or durability requirements set forth in these specifications, the engine manufacturer will be subject to revocation or suspension of Executive Orders for the applicable engine families and subject to being enjoined from any further sales, or distribution, of such noncompliant engine families, in the State of California pursuant to section 43017 of the Health and Safety Code. Additional penalties may be assessed to the extent permissible under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the engine manufacturer, the Executive Officer will consider any information provided by the engine manufacturer.

(2) If the Executive Officer finds any original equipment manufacturer using labels for which it has responsibility for attaching that are different from those approved or that do not substantially comply with the readability or durability requirements set forth in these specifications, the equipment manufacturer will be subject to being enjoined from any further sales or distribution, of applicable equipment product line that uses noncompliant labels in the State of California pursuant to section 43017 of the Health and Safety Code. Additional penalties may be assessed to the extent permissible under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the equipment manufacturer, the Executive Officer will consider any information provided by the equipment manufacturer.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

## **§ 2443.2. Consumer/Environmental Label Requirements.**

(a) Purpose. The purpose of this section is to require engine manufacturers to affix a single label on each production spark-ignition marine engine (or watercraft, as applicable) that provides potential engine owners, engine owners, and enforcement personnel with information on the relative cleanliness of the engine under the Air Resources Board's standards.

(b) Applicability. This section applies to:

(1) Model year 2001 and later spark-ignition personal watercraft and outboard marine engines and model year 2003 and later spark-ignition sterndrive and inboard marine engines, which have been certified to the applicable emission standards pursuant to Health and Safety Code section 43013;

(2) Federally certified spark-ignition marine engines produced prior to model year 2001 that comply with the emission standards pursuant to section 2442; and

(3) Spark-ignition personal watercraft and outboard marine engines produced prior to model year 2001 and shown by the manufacturer to comply with the emission standards pursuant to section 2442.

(c) If an engine manufacturer has a certified spark-ignition marine engine family to an FEL at or below the exhaust emission standard designated in section 2442(a), Table 1, the engine manufacturer (or equipment/watercraft manufacturer who uses such engines) must label each new engine within the engine family as a compliant engine pursuant to this section. If the engine family fails in-use compliance and/or production line testing and corrective action is not taken within thirty (30) days, the engine manufacturer must cease representation of any engines within the family as compliant engines. In this case, corrective action refers to only physical changes made to bring the engine into compliance with its original FEL. Spark-ignition marine engines as described in paragraph (b)(2) may be labeled pursuant to the provisions of this section before the 2001 model year if such engines comply with Title 40, Code of Federal Regulations, Part 91 [October 4, 1996], which is incorporated herein by reference. Spark-ignition marine engines as described in paragraph (b)(3) may be labeled pursuant to the provisions of this section before the 2001 model year if such engines are tested using certification test procedures plus a thirty (30) percent deterioration factor, as applicable. Alternative demonstrations of emissions performance may be used for engine described in paragraphs (b)(2) and (b)(3) if the engine manufacturer demonstrates to the Executive Officer's satisfaction that the

emissions performance is representative of actual emissions for the engine family. Any use of the label described below counter to the requirements set forth herein violates this section and may be subject the engine manufacturer to penalties as permitted by Part 5, Division 26 of the Health and Safety Code.

(1) Facsimiles of the label format are shown in Figure 1.

**Figure 1**



(NOTE: Labels are not to scale.)

(A) The engine manufacturer must ensure that the label has the following characteristics:

(i) Oval shape;

(ii) Dimensions of no less than three inches wide by two and a half inches high, except that it may be no less than two inches by one and two-thirds inches high for engines that have power outputs of 11.2 kW (15 hp) or less;

(iii) A watermark as shown in Figure 2 that is a clear laminate. The watermark must cover the entire label and be screened at no less than fifteen percent; and

(iv) All written information required by paragraph (c)(4)(B) must be in the English language and the font must be sans serif. The characters must be a minimum of two (2) millimeters in height except as specified in paragraph (b)(1)(B)(i)(d), and of a color that contrasts with the background on which it is displayed.

Figure 2



(B) Multiple levels of cleanliness. Progressively clean engines shall carry the following notations (as applicable):

(i) An engine that has an FEL or that has been certified at or below the hydrocarbon plus oxides of nitrogen standard listed in Table 44 of this section for Tier 1 must include the phrase "**LOW EMISSION**" and a single star symbol as shown in Figure 1.

(ii) An engine that has an FEL or that has been certified at or below the hydrocarbon plus oxides of nitrogen standard listed in Table 44 of this section for Tier 2 must include the phrase "**VERY LOW EMISSION**" and two star symbols as shown in Figure 1.

(iii) An engine that has an FEL or that has been certified at or below the hydrocarbon plus oxides of nitrogen standard listed in Table 44 of this section for Tier 3 must include the phrase "**ULTRA LOW EMISSION**" and three star symbols as shown in Figure 1.

(iv) An engine that has an FEL or that has been certified at or below the hydrocarbon plus oxides of nitrogen standard listed in Table 4 of this section for Tier 4 must include the phrase "**SUPER ULTRA LOW EMISSION**" and four star symbols as shown in Figure 1.

**Table 14.**

<b>Hydrocarbon plus Oxides of Nitrogen Standards (in g/kW-hr)</b>		
<b>Tier</b>	<b>P &lt; 4.3</b>	<b>P ≥ 4.3</b>
1	81.00	$(0.25 \times (151 + 557/P^{0.9})) + 6.0$
2	64.80	$(0.20 \times (151 + 557/P^{0.9})) + 4.8$
3	30.00	$(0.09 \times (151 + 557/P^{0.9})) + 2.1$
<u>4</u>	<u>5.0</u>	<u>5.0</u>

Where P means the average power in kW (sales-weighted) of the subject engine family.

(iv) All phrases encircling the top portion must have block characters that are a minimum of five (5) millimeters in height except that the characters may be three (3) millimeters for labels sized as allowed pursuant to paragraph (c)(1)(A)(i) for engines that have power outputs of 11.2 kW (15 hp) or less.

(C) Language other than that specified in paragraph (b)(1)(B) must not be used unless permitted by the Executive Officer.

(D) The color of the outer oval and stars on the label must contrast with the engine cover or watercraft hull. The color of the interior oval (i.e., background for the stars) must contrast with the color of the outer oval and stars.

(2) Label location. For outboard engines, a single label must be permanently affixed to the back of the engine cover or cowling. For personal watercraft, sterndrives and inboards, a single label must be affixed two or three inches to the right of the required location of the California Assigned Vessel Number displayed on the port side of the hull. Each label must be manufactured and permanently affixed so that it cannot be removed without destroying or defacing the label, must be readily visible and must not be affixed to any location that is likely to be replaced during the engine's useful life. For the purposes of this paragraph, readily visible means that the label's shape and number of stars are discernable from a distance of 100 feet.

(3) The labels and any adhesives used must be designed to withstand, for the engine's or watercraft's useful life, typical environmental conditions in the area where the labels required by this section are affixed. Typical equipment environmental conditions include, but are not limited to, exposure to extreme heat or cold, moisture, engine fuels, lubricants and coolants (e.g., gasoline, motor oil, saltwater, ethylene glycol). The engine manufacturer must submit, with its certification application, a statement attesting that its labels and engine identification numbers comply with these requirements.

(4) (A) Labels must be affixed to new watercraft or engines by the engine manufacturer or the original equipment manufacturer. If affixed by the original equipment manufacturer, the engine manufacturer remains the ultimate party responsible for ensuring that the labels are correctly administered. Improper labeling or distributing of labels will subject the engine manufacturer to penalties as described in paragraph (h).

(B) Labels on engines or watercraft described in paragraphs (b)(2) and (b)(3) may be applied by either the engine manufacturer, the original equipment manufacturer, distributors or dealers. However, the engine manufacturer remains the ultimate party responsible for ensuring that the labels are correctly administered. Improper labeling or distributing of labels will subject the engine manufacturer to penalties as described in paragraph (h). If the labels are applied by the distributor or dealer, the engine manufacturer must include its name and a serial number on the lower portion of the label as shown in Figure 1. The format of the serial number will be two alpha characters followed by five numeric characters (e.g., AA12345). The serial numbers must be recorded by the distributor or dealer and reported to the manufacturer of the engine when installed on a pre-2001 model year watercraft or engine. These numbers must be made available to the Executive Officer upon request.

(d) If the engine or watercraft cannot be adequately labeled under the requirements of paragraph (c), the engine manufacturer may request modification of these requirements from the Executive Officer.

(e) Replacement engines installed in hulls, cowlings or watercraft that had been previously labeled in accordance with these specifications must have identical or improved emissions to that of the original certified engine.

(f) Samples of all labels produced pursuant to this section must be submitted to the Executive Officer with the applicable certification application.

(g) Engines that are labeled in accordance with this section and subsequently modified with add-on or modified parts that are not exempted by the Executive Officer, are subject to label removal by an ARB Enforcement Officer or other authorized party.

(h) If the Executive Officer finds any engine manufacturer using labels for which it has responsibility for attaching that are different from those approved or that do not substantially comply with the discernibility or durability requirements set forth in these specifications, the engine manufacturer will be subject to being enjoined from any further sales or distribution, of applicable equipment product line that uses noncompliant labels in the State of California pursuant to section 43017 of the Health and Safety Code. If the Executive Officer finds any engines or watercraft with labels that are not affixed in accordance with paragraph (c)(1)(B), the engine manufacturer must remove the labels from all affected watercraft and engines and will be subject to being enjoined from any further sales or distribution, of applicable equipment product line that uses noncompliant labels in the State of California pursuant to section 43017 of the Health and Safety Code. Additional penalties may be assessed to the extent permissible under Part 5, Division 26 of the Health and Safety Code. Before seeking remedial action against the engine or equipment manufacturer, the Executive Officer will consider any information provided by the engine or equipment manufacturer.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

### **§ 2443.3. Environmental Label/Consumer Notification Requirements.**

(a) Applicability. This section applies to model year 2001 and later spark-ignition personal watercraft and outboard marine engines and model year 2003 and later spark-ignition sterndrive and inboard marine engines, which have been certified to the applicable emission standard pursuant to Health and Safety Code section 43013.

(b) A nonpermanent label (i.e., hang tag) must be attached to each engine or watercraft, as applicable, at time of sale that includes a copy of the following:

Front of Hang Tag:

“

***The Star Label means Cleaner Marine Engines***

This engine has been certified as a:



(<Check appropriate box.>)

**The Symbol for Cleaner Marine Engines:**

**Cleaner Air and Water** – for a healthier lifestyle and environment.

**Better Fuel Economy** – burns up to 30-40 percent less gas and oil than conventional carbureted two-stroke engines, saving money and resources.

**Longer Emissions Warranty** – protects consumer for worry free operation.

“



## Back of Hang Tag:

“

<facsimile of the one\_star label>

### ***One Star – Low Emission***

The one-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2001 exhaust emission standards. Engines meeting these standards have 75% lower emissions than conventional carbureted two-stroke engines. These engines are equivalent to the U.S. EPA's 2006 standards for marine engines.

<facsimile of the two\_star label>

### ***Two Stars – Very Low Emission***

The two-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2004 exhaust emission standards. Engines meeting these standards have 20% lower emissions than One Star – Low-Emission engines.

<facsimile of the three\_star label>

### ***Three Stars – Ultra Low Emission***

The three-star label identifies engines that meet the Air Resources Board's Personal Watercraft and Outboard marine engine 2008 exhaust emission standards or the Sterndrive and Inboard marine engine 2003-2008 exhaust emission standards. Engines meeting these standards have 65% lower emissions than One Star – Low Emission engines.

<facsimile of the four\_star label>

### ***Four Stars – Super Ultra Low Emission***

The four-star label identifies engines that meet the Air Resources Board's Sterndrive and Inboard marine engine 2009 exhaust emission standards. Personal Watercraft and Outboard marine engines may also comply with these standards. Engines meeting these standards have 90% lower emissions than One Star – Low Emission engines.

<White Space for dealer or manufacturer identification or additional information>

Cleaner Watercraft – Get the Facts  
1-800-END-SMOG  
[www.arb.ca.gov](http://www.arb.ca.gov)

”

(1) Facsimiles of the ~~three~~four environmental labels, as described in section 2443.2(c)(1), with the appropriate label circled or otherwise identified as being applicable to the spark-ignition marine engine, must be displayed on the nonpermanent label. Each facsimile must have dimensions no less than one inch by four-fifths inch.

(2) For outboard engines greater than 130 horsepower, facsimiles of only the “Low Emission Engine” and “Very Low Emission Engine” labels described in sections 2443.2 (c)(1)(B)(i) and (ii) need to be displayed on the nonpermanent label until the earlier of:

(A) the 2004 model year; or

(~~b~~B) the first model year after the date the ARB certifies the first outboard engine family greater than 130 horsepower to the 2008 model year standards.

(3) For personal watercraft, facsimiles of only the “Low Emission Engine” and “Very Low Emission Engine” labels described in sections 2443.2(c)(1)(B)(i) and (ii) need to be displayed on the nonpermanent label until the earlier of:

(A) the 2004 model year; or

(~~b~~B) the first model year after the date the ARB certifies the first personal watercraft engine family to the 2008 model year standards.

(4) All textual information (i.e., characters and/or lettering) required by this section must be no smaller than two (2) millimeters in height.

(c) The information required by paragraph (b) must also be provided in the owner’s manual and in the engine manufacturer’s application for certification.

(d) Samples of all labels produced pursuant to this section must be submitted to the Executive Officer with the applicable certification application.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

**§ 2444.1. In-Use Compliance Testing and Recall Regulations – Model Year 2001 and Later Spark-Ignition Marine Engines.**

(a) Applicability. This section applies to model year 2001 and later spark-ignition marine engines, which have been certified to the applicable emission standards pursuant to Health and Safety Code section 43013. Spark-ignition sterndrive and inboard marine engines shall comply with the in-use testing requirements found in title 13, California Code of Regulations, sections 2111, et seq.

(b) Manufacturer In-Use Compliance Test Procedures.

(1) For the purposes of this section, the Air Resources Board will accept emission data collected from the in-use testing program implemented by the United States Environmental Protection Agency as specified in Title 40, Code of Federal Regulations, section 91.803 [October 4, 1996], which is incorporated herein by reference.

(2) The Executive Officer, may, upon notice to the engine manufacturer and after review of the engine families identified by the United States Environmental Protection Agency for federal in-use testing, prescribe that a California-specific in-use testing program be conducted pursuant to paragraph (b)(3) at the engine manufacturer's expense if:

(A) The results obtained from the federal in-use test program pursuant to paragraphs (b)(1) of this section are determined not to be representative of engines sold and operated in California; or;

(B) The necessity is supported by other data or information (e.g., California-only engine families).

(3) California In-Use Testing Program.

(A) The Executive Officer shall identify engine families and those configurations within families offered for sale in California that the engine manufacturer must then subject to in-use testing for the specified model year. The number of engine families identified shall not exceed 25 percent of the engine manufacturer's families offered for sale in California. The Executive Officer may allow for reduced testing upon the engine manufacturer's demonstration of consistent compliance with the applicable emission standards.

(B) Number of Engines to be Tested. The number of engines to be tested by an engine manufacturer must be determined by the following method:

(i) A minimum of two (2) engines per family provided that no engine fails any standard. For each failing engine, two (2) more engines must be tested until the total number equals ten.

(ii) For engine families of less than 50 engines (California sales) for the identified model year or for engine manufacturers who make less than or equal to 200 engines (California sales) for that model year, a minimum of one engine per family provided that this engine does not fail any standard. If this engine fails, two (2) more engines shall be tested. For each additional engine failure, the engine manufacturer must continue testing two (2) additional engines until the total number equals eleven.

(iii) If an engine family was certified using carryover emission data and has been previously tested under paragraph (b)(3)(B) without an ordered recall, then only one engine for that family must be tested. If this engine fails any standard, testing must be conducted as outlined in paragraphs (b)(3)(B), as applicable.

(C) At the discretion of the Executive Officer, an engine manufacturer may test more engines than the minimums described in paragraph (b)(3)(B) or may concede failure before testing a total of ten engines.

(D) The Executive Officer will consider failure rates, average emission levels and the existence of any defects among other factors in determining whether to pursue remedial action under this subsection. The Executive Officer may request an ordered recall pursuant to paragraph (e)(2)-

(E) The Executive Officer may approve an alternative to engine manufacturer in-use testing where:

(i) engine family production in California is less than or equal to 20 per year; or

(ii) engines cannot be obtained for testing because they are used substantially in watercraft that are not conducive to engine removal such as large watercraft where the engine cannot be removed without dismantling either the engine or the watercraft; or

(iii) other compelling circumstances associated with the structure of the industry and uniqueness of spark-ignition marine engine applications. Such alternatives shall be designed to determine whether the engine family is in compliance in-use.

(F) Collection of In-Use Engines. The engine manufacturer shall procure in-use engines that have been operated between half and three-quarters of the engine's useful life. For purposes of paragraph (b) only, "useful life" means ten (10) years or 350 hours of operation for outboard engines and five (5) years or 350 hours of operation for personal watercraft engines. The engine manufacturer may test engines from more than one model year in a given year. The engine manufacturer shall begin testing within twelve (12) months after receiving notice that the Executive Officer has identified a particular engine family for testing and shall complete testing within twelve months from the start of such testing. Test engines may be procured from sources associated with the engine manufacturer (i.e., manufacturer-established fleet engines, etc.) or from sources not associated with the engine manufacturer (i.e., consumer-owned engines, independently-owned fleet engines, etc.).

(G) Maintenance, Procurement and Testing of In-Use Engines.

(i) A test engine must have a maintenance and use history representative of actual in-use conditions.

~~(a)~~a. The engine manufacturer must obtain information from the end users regarding the accumulated usage, maintenance, operating conditions and storage of the test engines.

~~(b)~~b. Documents used in the procurement process must be maintained as required by section 30 of the Test Procedures.

(ii) The engine manufacturer may perform minimal "set-to-specification" maintenance on components of a test engine that are not subject to parameter adjustment. Maintenance may include only that which is listed in the owner's manual

for test engines with the amount of service and age of the acquired engine. Documentation shall be maintained and retained as required by section 30 of the Test Procedures.

(iii) At least one valid emission test, performed according to the test procedures outlined in Part IV of the Test Procedures is required for each in-use engine.

(iv) The Executive Officer may waive portions or requirements of the test procedures, if any, that are not necessary to determine in-use compliance.

(v) If a selected in-use engine fails to comply with any applicable emission standard, the engine manufacturer must determine the reason for noncompliance. The engine manufacturer must report all such reasons of noncompliance within fifteen days of completion of testing.

(c) Reports and Evaluation.

(1) The engine manufacturer must maintain and submit sufficient records to the Executive Officer within three months of completing testing from the in-use program. These records must include, but need not be limited to, the following for each test engine:

- (A) Engine family.
- (B) Engine model.
- (C) Engine identification (or serial) number.
- (D) Date of manufacture.
- (E) Estimated hours of use.
- (F) Date and time of each test attempt.
- (G) Results (if any) of each test attempt.
- (H) Results of all emission testing.
- (I) Summary of all maintenance and/or adjustments performed.
- (J) Summary of all modifications and/or repairs.
- (K) Determinations of noncompliance and probable causes of failure.
- (L) Description of operating and storage conditions.

(2) If the results of the in-use emission tests indicate that the average emissions of the test engines for any regulated pollutant exceed the applicable emission standards specified in Title 13, California Code of Regulations, section 2442, the entire engine population so represented shall be deemed to exceed the standards. The Executive Officer shall notify the engine manufacturer of the test results and upon receipt of the notification, the engine manufacturer has 45 days to submit a plan to

make up all excess emissions resulting from in-use testing non-compliance in accordance with paragraph (c)(3). If excess emissions cannot be made up in accordance with paragraph (c)(3), the engine manufacturer must implement a voluntary recall plan in accordance with the applicable portions of paragraphs (d) and (e). If no excess emissions cannot be made up in accordance with paragraph (c)(3) and the engine manufacturer does not implement a voluntary recall plan, the Executive Officer may prescribe the implementation of an ordered recall pursuant to the applicable portions of paragraph (e)(2).

(3) All excess emissions resulting from in-use noncompliance with the California standard must be made up in the model year following the model year in which the notification of noncompliance is received. In-use noncompliance may not be remedied through implementation of the federal in-use credit program described in Title 40, Code of Federal Regulations, Part 91, Subpart N [October 4, 1996]. As an alternative to recall and with prior approval from the Executive Officer, the engine manufacturer may make up the excess emissions by any one or combination of the following options:

(A) Recertification of the noncompliant engine family to a lower emission level (or higher FEL) that makes up for the noncompliance, while maintaining compliance on a corporate average basis;

(B) Implementation of a running change and/or field fix on the noncompliant engine family;

(C) Implementation of market-based incentives, to be approved by the Executive Officer, to make up the noncompliance; or

(D) Payment of a noncompliance penalty to be determined by the Executive Officer on a per engine basis as provided by Part 5, Division 26 of the Health and Safety Code.

(d) Voluntary Emission Recalls.

(1) When an engine manufacturer initiates a voluntary emission recall campaign, the Executive Officer shall be notified of the recall at least thirty (30) days before owner notification is to begin. The engine manufacturer shall also submit a voluntary recall plan for approval, as described in paragraph (e) below. A voluntary recall plan shall be deemed approved by the Executive Officer within thirty (30) days after receipt of the recall plan unless objected to in the interim.

- (2) (A) When any engine manufacturer, based on enforcement test results or any other information provided to or required by the ARB, proposes to initiate a voluntary emission recall program, the engine manufacturer shall submit for approval by the Executive Officer an emission recall plan as described in paragraph (e) below. The plan shall be submitted within 45 days following the receipt of a notification from the ARB that enforcement test results or other information demonstrate an engine noncompliance.

(B) The Executive Officer shall approve the recall plan in writing if it contains the information specified in paragraph (e) where specified and is designed to notify the engine/watercraft owner and correct the noncompliance in an expeditious manner. Notification of engine/watercraft owners and the implementation of recall repairs shall commence no later than the schedule specified under paragraph (e)(1)(C) and (e)(1)(D), respectively, unless the engine manufacturer can show good cause for the Executive Officer to extend the deadline. If the plan does not contain the provisions of paragraph (e), the Executive Officer shall disapprove the plan in writing and require revisions where deemed necessary. The engine manufacturer may contest such a disapproval by requesting a hearing pursuant to Subchapter 1.25, Title 17, California Code of Regulations. If no request for a hearing is made or the hearing upholds the disapproval, the engine manufacturer shall incorporate all requested revisions to the plan and begin implementation of the recall plan within sixty (60) days of receipt of the disapproval.

(C) The engine manufacturer may also request a public hearing pursuant to the procedures set forth in Subchapter 1.25, Title 17, California Code of Regulations to contest the finding of nonconformity and the need for an ordered recall. If such a hearing occurs and the nonconformity is confirmed therefrom, the engine manufacturer shall submit the recall plan required by paragraph (e)(2) within thirty (30) days after receipt of the Board's decision unless an extension is granted by the Executive Officer.

(e) Voluntary and Ordered Recall Plans.

- (1) The recall plan for voluntary and ordered recalls must be submitted to the Executive Officer for review and must contain the following information unless otherwise specified:

(A) A description of each class or category of engines recalled, including the number of engines to be recalled, the model year, and such other information as may be required to identify the engines recalled;



(B) A description of the specific modifications, alterations, repairs, corrections, adjustments or other changes to be made to correct the engines affected by the emission-related defect;

(C) A description of the method by which the engine manufacturer will notify engine/watercraft owners;

(D) A description of the procedure to be followed by engine/watercraft owners to obtain correction of the nonconformity. This may include the date on or after which the engine/watercraft owner can have the nonconformity corrected, the time reasonably necessary to perform the labor to correct the nonconformity and the designation of facilities at which the nonconformity can be remedied;

(E) A description of the class of persons other than dealers and authorized warranty agents of the engine manufacturer who will remedy the defect;

(F) A description of the system by which the engine manufacturer will assure that an adequate supply of parts is available to perform the repair under the plan, including the date by which an adequate supply of parts will be available to initiate the repair campaign, and the method to be used to assure the supply remains both adequate and responsive to engine/watercraft owner demand;

(G) A copy of the letter of notification to be sent to engine/watercraft owners; and

(H) A copy of all necessary instructions to be sent to those persons who are to perform the repair;

(2) For an ordered recall, the recall plan shall include the information required for voluntary recall plans as specified in paragraphs (e)(1). Additionally, it shall include the following:

(A) A plan describing how the maximum feasible capture rate will be achieved for recalls based on either the exceedance of emission standard or on the failure of an emission-related component.

(B) The plan shall also include a schedule for implementing actions to be taken including identified increments of progress towards implementation and deadlines for completion of each increment. If, after good faith efforts, the engine manufacturer cannot reach the maximum feasible capture rate by the applicable deadline, the

engine manufacturer must propose mitigation efforts to be approved by the Executive Officer that will offset the emissions of the unrepaired engines.

(3) The engine manufacturer must not condition repair of the noncomplying engine/watercraft on the proper maintenance or use of the engine except for compelling reasons approved by the Executive Officer. The engine manufacturer, however, is not obligated to repair a component which has been removed or modified.

(4) Record keeping and Reporting Requirements.

(A) The engine manufacturer shall report on the progress of the voluntary or ordered recall program by submitting a report one year from the date owner notification begins and a final report an additional year later. Such reports shall be submitted to the Chief, Mobile Source Operations Division, P.O. Box 8001, 9528 Telstar Avenue, El Monte, CA 91734-8001. For each class of engine subject to the recall program, the yearly report shall contain:

(i) Engine family and emission recall campaign number designated by the engine manufacturer.

(ii) Date engine/watercraft owner notification was begun, and date completed.

(iii) Number of engines involved in the voluntary or ordered recall campaign.

(iv) Number of engines known or estimated to be affected by the nonconformity and an explanation of how this number was determined.

(v) Number of engines inspected pursuant to the voluntary or ordered recall plan.

(vi) Number of inspected engines found to be affected by the nonconformity.

(vii) Number of engines receiving repair under the recall plan and a listing of these engines' engine identification numbers.

(viii) Number of engines determined to be ineligible for recall action due to removed or modified parts.

(ix) A copy of any service bulletins transmitted to dealers or other authorized repair facilities which pertain to the nonconformity to be corrected and that have not previously been reported.

(x) A copy of all communications transmitted to engine/watercraft owners that relate to the nonconformity and that have not previously been submitted.

(B) If the engine manufacturer determines that any of the information submitted pursuant to paragraph (5)(A) above has changed or was incorrect, revised information and an explanation must be submitted. Responses to subsections ~~(5)(4)~~(A)(v), (vi), (vii), (viii) and (ix) above shall be cumulative totals.

(C) The engine manufacturer shall maintain the names and addresses of engine/watercraft owners:

(i) To whom notification was given;

(ii) Whose engines were repaired or inspected under the recall plan; and

(iii) Whose engines were determined not to qualify for repair due to removed or modified components.

(D) All reports shall be maintained for not less than one year beyond the useful life of the engines and shall be made available to authorized personnel of the ARB upon request.

(f) Penalties. Under an ordered recall, failure of the engine manufacturer to notify engine/watercraft owners and repair the engines in the manner specified in the recall plan constitutes a violation of Health and Safety Code section 43105 and subjects the engine manufacturer to penalties pursuant to Part 5, Division 26 of the Health and Safety Code.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

**§ 2444.2. On-Board Engine Malfunction Detection System Requirements – Model Year 2007 and Later Spark-Ignition Sterndrive and Inboard Marine Engines.**

Beginning with 2007 model year spark-ignition sterndrive and inboard marine engines certified to the 5.0 grams per kilowatt-hour HC+NO<sub>x</sub> standard, the requirements for subsections (a) through (k) below shall be implemented as follows. For all 2009 model year and later spark-ignition sterndrive and inboard marine engines, requirements in **bold type** will also apply.

Diagnostic systems shall, at a minimum, comply with the requirements of Title 13, section 1968, “Malfunction and Diagnostic System for 1988 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles with Three-Way Catalyst Systems and Feedback Control,” California Code of Regulations, except as otherwise stipulated below.

(a) General requirements.

(1) Spark-ignition sterndrive and inboard marine engines sold as new shall be equipped with an on-board diagnostics-marine (OBD-M) system to identify emission-related malfunctions by means of diagnostic trouble codes stored in non-volatile computer memory. Emission-related malfunctions are not limited to emission control components and systems only, but to any other electronic component or system that can affect emissions including the on-board computer itself. Additionally, OBD-M systems shall have the capability to activate an audio or visual alert device located on the marine vessel to inform vessel occupants in the event of emission-related malfunctions, and to transmit diagnostic information locally via a standardized data link connector.

(2) Spark-ignition sterndrive and inboard marine vessels shall be equipped with an audio alert device and/or visual alert device that is compatible with the activation function of the OBD-M system on the installed engine.

(A) If equipped, the audio alert device shall provide sufficient volume and intensity to be readily perceptible to vessel occupants during virtually any mode of vessel operation and occupant activity, but shall not exceed applicable maximum noise levels as set by authorized federal or State agencies. Further, the audio alert device shall in no way impede the function of required sound-signaling devices, or other safety-related devices, already present on the vessel. The audio alert device shall sound briefly at reduced-volume in the engine-run key position during engine cranking to indicate that the audio alert device is functional and

shall, when activated, emit a periodic series of five full-volume bursts separated by no more than a two second interval between bursts and fifteen minutes between series. **Notwithstanding, the audio alert device shall emit a pulsating full-volume burst at one-second intervals during the detection of severe misfire that can cause damage to the catalytic converter.**

(B) If equipped, the visual alert device shall provide sufficient activation and be located such that it is readily visible under all lighting conditions, but shall in no way impede the function of any visual distress-signaling device, fog signal, or navigational light. The visual alert device shall activate in the engine-run key position before engine cranking to indicate that the visual alert device is functional and shall, when activated, display the phrase "Service Required." Alternatively, the International Standards Organization (ISO) engine symbol may be substituted for the phrase. **Notwithstanding, the visual alert device shall blink at one-second intervals during the detection of severe misfire that can cause damage to the catalytic converter.**

(3) Malfunction thresholds for catalyst, **misfire**, fuel system, oxygen sensor, and oxygen sensor heater diagnostics shall be determined by the engine manufacturer such that emissions do not exceed applicable emission certification standards, based on the Spark-Ignition Marine Engine test cycle, by more than 50 percent before the malfunction thresholds have been reached. Malfunction thresholds for other monitored components and systems shall not be limited to a percent increase above the standards, but shall be determined by the engine manufacturer to indicate when components or systems are no longer operating within design tolerances.

(4) Regarding diagnostic system monitoring and audio/visual alert device activation requirements, engine manufacturers are required to define monitoring conditions that are representative of typical in-use operation, and which will result in the routine execution and completion of all IMDN diagnostics in-use. With the exception of **misfire**, fuel system, and comprehensive component monitoring, these conditions shall occur within a steady-state window of operation defined by throttle position, delta throttle, engine load, and temperature. Within this window, monitors are required to execute, at least once per operating cycle, regardless of other operating conditions. A monitor must be enabled continuously while operating within the window; however, operation over the entire window shall not be permitted as a condition for monitoring completion. Further, all steady-state monitoring conditions must be designed such that they will be encountered below eighty-five percent of full throttle. Subject to Executive Officer approval, engine manufacturers may request the

inclusion of other monitoring conditions to define the window of operation in the event a suitable environment to reliably diagnose a particular monitoring strategy has not been provided. In approval of the request, the Executive Officer shall consider the extent to which the use of additional conditions provide for more effective and frequent in-use monitoring during normal operation. **Misfire**, fuel system, and comprehensive component monitors shall not be limited to steady-state windows of operation, but shall function continuously throughout the operating cycle. Upon detection of a malfunction, except as noted in paragraphs (a)(2)(A) and (a)(2)(B) above, the audio/visual alert device is to be activated and a diagnostic trouble code stored no later than the end of the next operating cycle during which monitoring occurs provided the malfunction is again detected.

(5) For model years 2007-2008, activation of the audio/visual alert device upon detection of a catalyst, fuel system, or oxygen sensor or heater malfunction shall be optional. The audio/visual alert device activation for these model years shall be mandatory for other monitoring requirements. The audio/visual alert device shall be activated during these model years for lack of function for electronic components/systems otherwise approved for audio/visual alert device suppression. Furthermore, there are no exemptions from storing diagnostic trouble codes in non-volatile computer memory during these model years for any malfunction. The OBD-M must be capable of fully communicating stored information to a generic scan tool via the standardized data link connector.

(6) Engine manufacturers may employ alternate statistical audio/visual alert device activation and diagnostic trouble code storage protocols to those specified in these requirements, subject to Executive Officer approval, based on comparable timeliness in detecting a malfunction and evaluating system performance. For strategies requiring, on average, between three and six operating cycles for audio/visual alert device activation, the engine manufacturer shall provide data and/or an engineering evaluation which adequately demonstrate that the monitoring system is equally effective and timely in detecting deterioration. Strategies requiring on average more than six operating cycles for audio/visual alert device activation shall not be accepted.

(7) Should emission control devices/strategies be introduced on the engine in addition to those identified herein as requiring monitoring (e.g., exhaust gas recirculation), engine manufacturers shall submit a plan for Executive Officer approval of the monitoring strategy and malfunction thresholds prior to its incorporation into the OBD-M system. Executive Officer approval shall be based on the effectiveness of the monitoring strategy, the malfunction criteria utilized, and the frequency at which the monitoring conditions required by the diagnostic occur while in-use.

(8) Engine manufacturers may request Executive Officer approval to disable any diagnostic strategy at ambient engine starting temperatures below twenty degrees Fahrenheit (low ambient temperature conditions may be determined based on intake air or engine coolant temperature at engine starting), and at elevations above eight thousand feet above sea level provided the engine manufacturer submits data and/or an engineering evaluation which adequately demonstrate that monitoring would be unreliable when such conditions exist. Notwithstanding, diagnostic system disablement may be requested at other ambient engine starting temperatures if the engine manufacturer adequately demonstrates with data and/or an engineering evaluation that misdiagnosis would occur due to the impact of such ambient temperatures on the performance of the component itself (e.g., component freezing).

(9) Engine manufacturers may disable monitoring systems that can be affected by running out of fuel (e.g., misfire detection) when the fuel level is low, provided disablement will not occur when the fuel level is above fifteen percent of the nominal capacity of the fuel tank.

(10) Engine manufacturers shall not be required to individually monitor the positive crankcase ventilation system or the engine thermostat unless these devices are specifically used to enable the execution of other IMDN diagnostics.

(b) Monitoring requirements.

(1) Catalyst monitoring.

(A) Purpose and scope:

(i) The diagnostic system shall monitor the catalyst system on spark-ignited marine engines for proper combined conversion efficiency of hydrocarbons and oxides of nitrogen (HC+NO<sub>x</sub>).

(ii) Manufacturers of spark-ignited lean-burn marine engines may request that the Executive Officer exempt such applications from these catalyst monitoring requirements if it can be demonstrated that a reliable monitoring technology is not available. The Executive Officer shall approve such a request upon determining that all reasonable monitoring technologies have been considered to the extent possible.

(B) Malfunctioning criteria:

(i) The catalyst system shall be considered malfunctioning when its conversion efficiency decreases to the point that HC+NO<sub>x</sub> tailpipe emissions exceed the applicable HC+NO<sub>x</sub> certification standard by more than 50 percent, adjusted upward by the HC+NO<sub>x</sub> emissions from a representative 20 hour catalyst system (i.e.,  $[HC+NO_x]_{tailpipe} > 150\% \times [HC+NO_x]_{standard} + [HC+NO_x]_{20hour}$ ). All emissions measurements and standards are in reference to the spark-ignition marine engine test cycle.

(ii) Through the 2008 model year, as an option to setting malfunction thresholds by relating tailpipe emissions to a percent increase over applicable standards, engine manufacturers may specify relative malfunction thresholds based on a percent reduction of post-catalyst HC+NO<sub>x</sub> concentration compared to pre-catalyst HC+NO<sub>x</sub> concentration. In accordance with this provision, manufacturers may monitor the front catalyst independently of, or in combination with, the next catalyst downstream. Each monitored catalyst or catalyst combination shall be considered malfunctioning when total HC+NO<sub>x</sub> conversion efficiency falls below 60 percent while in normal closed loop operation. As a guideline, the catalyst(s) should not be considered malfunctioning when its efficiency is greater than 80 percent. The efficiency determination shall be based on a steady state test, wherein a malfunction is noted when the total HC+NO<sub>x</sub> emission concentration measured at the outlet of the monitored catalyst(s) is more than 20 to 40 percent of the cumulative total engine-out emissions measured at the inlet of the catalyst(s).

(iii) For artificially heated catalyst systems (electric, heat exchanger, etc.), the heating mechanism shall be considered malfunctioning when the catalyst does not reach its designated heating temperature within a requisite time period after engine starting. The time period is to be determined by the manufacturer subject to the conditions that it is representative of typical in-use operation and that it is sufficient to detect a heating system malfunction causing emissions to exceed the applicable HC+NO<sub>x</sub> certification standard by more than 50 percent.

(C) Monitoring conditions:

(i) The engine manufacturer shall choose a steady-state window of operation defined by throttle position, delta throttle, engine load, and temperature for monitoring the catalyst with the constraints that the check shall:



a. occur within a  $\pm$  15 percent throttle position window between 25 percent and 85 percent of full throttle, or at idle should a catalyst warm-up temperature profile strategy be employed,

b. be tolerant of throttle position fluctuations or changes less than 1 percent per second over any two second interval within the throttle position window,

c. take no more than a 40-second interval to determine both that the engine is operating in a proper window to perform the check and to actually perform the check, and

d. be conducted at the earliest acceptable opportunity encountered after the beginning of each operating cycle.

Performance of the check may be delayed after engine startup until stabilized coolant temperature is achieved and/or a suitable cumulative time interval of non-closed throttle engine operation has elapsed to ensure the catalyst is warmed-up for properly performing the monitoring check. The specified cumulative time interval shall begin from the first non-closed throttle operation either after achieving a stabilized coolant temperature or after engine starting and shall not exceed 180 seconds. These monitoring constraints and conditions may be altered, subject to Executive Officer approval. Such approval shall be granted if the engine manufacturer submits data and an engineering evaluation that, together, justify the need for the exception and demonstrate that the requested alteration would yield improved catalyst monitoring.

(ii) The monitoring system shall operate at least once per in-use operating cycle during which the engine manufacturer-defined monitoring conditions are met.

(D) Malfunctioning notification and diagnostic trouble code storage:

(i) Upon detection of a catalyst malfunction, the audio/visual alert device shall be activated and a diagnostic trouble code stored no later than the end of the next operating cycle during which monitoring occurs provided the malfunction is again present.

(ii) The diagnostic system shall temporarily disable catalyst monitoring when a malfunction exists that could affect the proper evaluation of catalyst efficiency.

(iii) The monitoring method for the catalyst(s) shall be capable of detecting when a catalyst trouble code has been cleared (except diagnostic system self-clearing), but the catalyst has not been replaced (e.g., catalyst overtemperature approaches may not be acceptable).

## **(2) Misfire monitoring.**

**(A) Purpose and scope: The diagnostic system shall monitor for engine misfire. The diagnostic system does not have to identify the misfiring cylinder(s), however misfire must be identified regardless of whether it occurs in a single or multiple number of cylinders.**

**(B) Malfunctioning criteria: The diagnostic system shall identify a malfunction when the total number of misfires exceeds a percentage of the total number of firing events necessary for satisfying the conditions listed below. These threshold percentages shall be determined by the engine manufacturer and provided in the certification documentation.**

**(i) The percent misfire evaluated in 200 crankshaft-revolution increments for each engine speed and load condition that would result in catalyst damage. Subject to Executive Officer approval, a longer interval may be employed (but only for determining, on a given operating cycle, the first misfire exceedance in paragraph (b)(2)(D)(i)(a) below) provided the engine manufacturer submits data and/or an engineering evaluation which adequately demonstrate that catalyst damage would not occur due to unacceptably high catalyst temperatures before the interval has elapsed. The engine manufacturer shall submit in the certification documentation catalyst temperature data versus percent misfire over the full range of engine speed and load conditions. The data shall be obtained from a representative cross section of an engine manufacturer's engine offerings from small to large displacements. Up to three such engine evaluations shall be documented per engine manufacturer, though an engine manufacturer may submit more data if desired. An engineering evaluation shall be provided for establishing malfunction criteria for the remainder of engine families in the engine manufacturer's product line. The Executive Officer shall waive the evaluation requirement each year if, in the judgment of the Executive Officer, technological changes do not affect the previously determined malfunction criteria;**

(ii) The percent misfire evaluated in 1000 crankshaft-revolution increments that would cause emissions from an aged engine (480 hours) to exceed any of the spark-ignition marine engine test cycle-based standards by more than 50 percent if the degree of misfire were present from the beginning of the test. Subject to Executive Officer approval, an engine manufacturer may employ other crankshaft-revolution increments if the engine manufacturer adequately demonstrates that the strategy is equally effective and timely in detecting misfire. For the purpose of establishing the percent misfire, the engine manufacturer shall conduct the demonstration test(s) with the misfire events occurring at equally spaced complete engine cycle intervals, across randomly selected cylinders throughout each 1000 crankshaft-revolution increment. However, the percent misfire established shall be applicable for any misfire condition (e.g., random, continuous, equally-spaced, etc.) for the purpose of identifying a malfunction. This criterion may be used for all engines containing the same number of cylinders as the aged engine. The number of misfires in 1000 crankshaft-revolution increments that was determined for the aged engine malfunction criterion may be used to establish the corresponding percent misfire malfunction criteria for engines with other numbers of cylinders. The malfunction criteria for an engine manufacturer's product line shall be updated when an aged engine is tested and subsequently indicates that more stringent criteria are necessary than previously established to remain within the above emission limit.

(C) Monitoring conditions:

(i) Except as provided for in paragraph (ii) below, monitoring for misfire shall be continuous from engine starting under all positive torque engine speeds and load conditions.

(ii) As an exception to monitoring misfire during all positive torque operating conditions, engine manufacturers may disable misfire monitoring in the engine operating region bound by the positive torque line (i.e., engine load with the transmission in neutral), and the two following engine operating points:

a. an engine speed of 3000 rpm with the engine load at the positive torque line; and

b. the redline engine speed (defined in section 2441) with the engine's manifold vacuum at four inches of mercury lower than that at the positive torque line.

Misfire detection systems unable to detect all misfire patterns under all required conditions shall be evaluated for compliance by the Executive Officer based on, but not limited to, the following factors:

c. the magnitude of the region(s) in which misfire detection is limited,

d. the degree to which misfire detection is limited in the region(s) (i.e., the probability of detection of misfire events),

e. the frequency with which said region(s) are expected to be encountered in-use,

f. the type of misfire patterns for which misfire detection is troublesome, and

g. demonstration that the monitoring technology employed is not inherently incapable of detecting misfire under required conditions (i.e., compliance can be achieved on other engines).

The evaluation shall be based on the following misfire patterns:

h. equally spaced misfire occurring on randomly selected cylinders,

i. single cylinder continuous misfire; and

j. paired cylinder (cylinders firing at the same crank angle) continuous misfire.

Further, with Executive Officer approval, the engine manufacturer may disable misfire monitoring or employ higher malfunction criteria when misfire cannot be distinguished from other effects (e.g., ocean bounce) when using the best available monitoring technology. The engine manufacturer shall present data and/or an engineering evaluation to the Executive Officer to justify the proposed action. Executive Officer approval shall be based on the extent to which

monitoring is expected to be disabled in relation to the capabilities of the best available monitoring technologies as applied to other engines. However, any such disablement occurring within the first 5 seconds after engine starting shall not require Executive Officer approval. Additionally, for engines with greater than eight cylinders, the Executive Officer shall waive the requirements of this section provided the engine manufacturer submits data and/or an engineering evaluation which adequately demonstrates that misfire detection throughout the required operating region cannot be achieved when employing proven monitoring technology (i.e., a technology that provides for compliance with these requirements on other engines) and provided misfire is detected to the fullest extent permitted by the technology.

(D) Malfunction notification and diagnostic trouble code storage:

(i) Upon detection of the level of misfire specified in paragraph (b)(2)(B)(i), the following criteria shall apply for audio/visual alert device activation and diagnostic trouble code storage:

a. A temporary diagnostic trouble code shall be stored and the audio/visual alert device shall activate once-per-second during actual misfire conditions no later than after the third exceedance of the specified misfire level when operating in the region bound by modes 2 through 5 of the spark-ignition marine engine test cycle and no later than after the first exceedance of the specified misfire level when operating at any other engine speed and load condition during a single operating cycle. While a temporary diagnostic trouble code is stored, the audio/visual alert device shall activate during every subsequent exceedance during the operating cycle but may remain inactive when misfire is not present. If the level of misfire is exceeded again (a single exceedance) during the following operating cycle or the next operating cycle in which similar conditions are encountered (as defined in paragraph (b)(3)(D)(iii)) or while a temporary diagnostic trouble code for the level of misfire specified in paragraph (b)(2)(B)(ii) is present, the audio/visual alert device shall activate as specified above, a diagnostic trouble code shall be stored, and the audio/visual alert device shall remain continuously activated, even if the misfire ceases. The initial temporary code and stored conditions may be erased if

misfire is not detected during the following operating cycle and similar conditions have been encountered without an exceedance of the specified misfire level. The code and conditions may also be erased if similar driving conditions are not encountered during 80 operating cycles subsequent to the initial detection of a malfunction.

b. Notwithstanding, in engines that provide fuel shutoff and default fuel control to prevent over fueling during misfire conditions, the audio/visual alert device need not activate at one-second intervals. Instead, the audio/visual alert device may activate continuously upon detection of misfire, in accordance with the requirements for continuous audio/visual alert device activation in paragraph (a) above, provided that the fuel shutoff and default control shall be activated as soon as misfire is detected. Fuel shutoff and default fuel control may be deactivated only to permit fueling outside of the misfire range.

(ii) Upon detection of the misfire level specified in paragraph (b)(2)(B)(ii), the following criteria shall apply for audio/visual alert device activation and diagnostic trouble code storage:

a. A temporary diagnostic trouble code shall be stored no later than after the fourth exceedance of the specified misfire level during a single operating cycle and the audio/visual alert device shall be activated and a diagnostic trouble code stored no later than the end of the following operating cycle or the next operating cycle in which similar conditions are encountered (as defined in paragraph (b)(2)(D)(iii)) if the level of misfire is again exceeded four times. The initial temporary code and stored conditions may be erased if misfire is not detected during the following operating cycle and similar conditions have been encountered without an exceedance of the specified misfire level. The code and conditions may also be erased if similar driving conditions are not encountered during 80 operating cycles subsequent to the initial detection of a malfunction.

b. Notwithstanding, a temporary diagnostic trouble code shall be stored no later than after the first exceedance of the specified misfire level during a single operating

cycle if the exceedance occurs within the first 1000 crankshaft-revolutions from engine start (defined in the glossary) during which misfire detection is active. The audio/visual alert device shall be activated and a diagnostic trouble code stored no later than the end of any subsequent operating cycle if misfire is again detected in the first 1000 crankcase revolutions. If similar conditions are encountered during a subsequent operating cycle without an exceedance of the specified misfire level, the initial temporary code and stored conditions may be erased. Furthermore, if similar driving conditions are not encountered during 80 operating cycles subsequent to the initial detection of a malfunction, the initial temporary code and stored conditions may be erased.

(iii) Upon detection of misfire, engine manufacturers shall store the engine speed, load, and warm-up status (i.e., cold or warmed-up) under which the first misfire event was detected that resulted in the storage of a temporary diagnostic trouble code. An operating cycle shall be considered to have similar conditions if the stored engine speed conditions are encountered within 375 rpm, load conditions within 20 percent, and the same warm-up status is present. With Executive Officer approval, other strategies for determining if similar conditions have been encountered may be employed. Approval shall be based on comparable timeliness and reliability in detecting similar conditions.

(3) Fuel system monitoring.

(A) Purpose and scope: The diagnostic system shall monitor the fuel delivery system for its ability to provide compliance with emission standards.

(B) Malfunction criteria: The engine manufacturer shall establish malfunction criteria to monitor the fuel delivery system such that an engine's emissions would not exceed the applicable HC+NO<sub>x</sub> certification standard by more than 50 percent before a fault is detected. If the engine is equipped with fuel trim circuitry, the engine manufacturer shall include as one of the malfunction criteria the condition where the trim circuitry has used up all of the trim adjustment allowed within the engine manufacturer's selected limit(s). Engine manufacturers may compensate the criteria limit(s) appropriately for changes in altitude or for other similar identifiable operating conditions when they occur.

(C) Monitoring conditions: The fuel system shall be monitored continuously for the presence of a malfunction.

(D) Malfunction notification and diagnostic trouble code storage:

(i) For fuel systems with short-term trim only capability, the diagnostic system shall store a diagnostic trouble code after the fuel system has attained the criteria limit for an engine manufacturer-defined time interval sufficient to determine a malfunction. If the malfunction criteria limit and time interval are exceeded, the audio/visual alert device shall be activated and a diagnostic trouble code stored no later than the end of the next operating cycle in which the criteria and interval are again exceeded; unless driving conditions similar to those under which the problem was originally detected have been encountered (see paragraph (iii) below) without such an exceedance, in which case the initial temporary code and stored conditions may be erased. Furthermore, if similar driving conditions are not encountered during 80 operating cycles subsequent to the initial detection of a malfunction, the initial temporary code and stored conditions may be erased.

(ii) For fuel systems with long-term fuel trim capability, upon attaining a long-term based malfunction criteria limit independent of, or in combination with, the short-term trim system status, the audio/visual alert device shall be activated and a diagnostic trouble code stored no later than the end of the next operating cycle if the malfunction is again detected. If the malfunction is not detected during the second operating cycle, the audio/visual alert device shall be activated and a diagnostic trouble code stored no later than the next operating cycle in which the malfunction is again detected; unless driving conditions similar to those under which the problem was originally detected have been encountered (see paragraph (iii) below) without an indication of a malfunction, in which case the initial temporary code and stored conditions may be erased. Furthermore, if similar driving conditions are not encountered during 80 operating cycles subsequent to the initial detection of a malfunction, the initial temporary code and stored conditions may be erased.

(iii) Upon detection of a fuel system malfunction, engine manufacturers shall store the engine speed, load and warm-up status (i.e., cold or warmed-up) under which the malfunction was detected. An operating cycle shall be considered to have similar conditions if the stored engine speed is encountered within 375 rpm.



load conditions within 20 percent, and the same warm-up status is present. With Executive Officer approval, other strategies for determining if similar conditions have been encountered may be employed. Approval shall be based on comparable timeliness and reliability in detecting similar conditions.

(4) Oxygen sensor monitoring.

(A) Purpose and scope:

(i) The diagnostic system shall monitor the output voltage, response rate, and any other parameter which can affect emissions, of all primary (fuel control) oxygen (lambda) sensors for malfunction. It shall also monitor all secondary oxygen sensors (fuel trim control or use as a monitoring device) for proper output voltage and/or response rate. Response rate is the time required for the oxygen sensor to switch from lean-to-rich once it is exposed to a richer than stoichiometric exhaust gas or vice versa (measuring oxygen sensor switching frequency may not be an adequate indicator of oxygen sensor response rate, particularly at low speeds).

(ii) Either the lean-to-rich or both the lean-to-rich and rich-to-lean response rates shall be checked. Response rate checks shall evaluate the portions of the sensor's dynamic signal that are most affected by sensor malfunctions such as aging or poisoning.

Engine manufacturers may observe the voltage envelope of the sensor when cycled at a frequency of 1.5 Hertz or greater, as determined by the engine manufacturer, to evaluate a slow response rate sensor (i.e., a slow sensor cannot achieve maximum and/or minimum voltage as will a good sensor, given a properly chosen switching frequency and fuel step change for the check). With Executive Officer approval, engine manufacturers may use alternative parameters to comply with this requirement such as voltage ranges and fuel-air switching frequencies based on a determination that the modifications will result in an accurate and timely evaluation of the sensor.

(iii) For sensors with different characteristics, the engine manufacturer shall submit data and an engineering evaluation to the Executive Officer for approval based on showing equivalent evaluation of the sensor.

(iv) For engines equipped with heated oxygen sensors, the heater circuit shall be monitored for proper current and voltage drop (note: a continuity check of oxygen sensors is not required). Other heater

circuit monitoring strategies would require approval by the Executive Officer based on equally reliable and timely indication of malfunction as current or voltage-based monitoring.

(B) Malfunction criteria:

(i) An oxygen sensor shall be considered malfunctioning when the voltage, response rate, or other criteria are exceeded and causes emissions from an engine equipped with the sensor(s) to exceed the applicable HC+NO<sub>x</sub> standard by more than 50 percent, or when sensor output characteristics are no longer sufficient (e.g., lack of sensor switching) for use as a diagnostic system monitoring device (e.g., for catalyst efficiency monitoring).

(ii) For heated oxygen sensors, the heater circuit shall be considered malfunctioning when the current or voltage drop in the circuit is no longer within the engine manufacturer's specified limits for normal operation (i.e., within the criteria required to be met by the component vendor for heater circuit performance at high mileage). Subject to Executive Officer approval, other monitoring strategy malfunction criteria for detection of heater circuit malfunctions may be used provided the engine manufacturer submits data and/or an engineering evaluation adequately showing monitoring reliability and timeliness to be equivalent to the stated criteria in this paragraph.

(C) Monitoring conditions:

(i) For primary oxygen sensor(s) used for fuel control, the response rate and output voltage shall be monitored for malfunction after the engine has commenced closed-loop operation. If the oxygen sensor(s) is used as part of the monitoring strategy for the catalyst, the oxygen sensor(s) diagnostics should be scheduled to execute before the catalyst diagnostics begin. The engine manufacturer shall choose a steady-state window of operation defined by throttle position, delta throttle, engine load, and temperature for monitoring the oxygen sensor with the constraints that the check shall:

a. occur within a  $\pm 10$  percent throttle position window between 35 percent and 85 percent of full throttle,

b. be tolerant of throttle position fluctuations or changes less than 1 percent per second over any two second interval within the throttle position window,

c. take no more than a 30 second interval to determine both that the engine is operating in a proper window to perform the check and to actually perform the check, and

d. be conducted at the earliest such condition encountered after the beginning of closed-loop operation for each operating cycle.

Performance of the check may be delayed after engine startup until stabilized coolant temperature is achieved and/or a suitable cumulative time interval of non-closed throttle engine operation has elapsed to ensure the oxygen sensor is warmed-up for properly performing the monitoring check. The specified cumulative time interval shall begin from the first non-closed throttle operation either after achieving a stabilized coolant temperature or after engine starting and shall not exceed 180 seconds. These monitoring constraints and conditions may be altered, subject to Executive Officer approval. Such approval shall be granted if the engine manufacturer submits data and an engineering evaluation that, together, justify the need for the exception and demonstrate that the requested alteration would yield improved oxygen sensor monitoring.

(ii) The monitoring system shall operate at least once per in-use operating cycle during which the engine manufacturer-defined monitoring conditions are met.

(iii) For secondary oxygen sensors used for catalyst monitoring and/or fuel system trim, the engine manufacturer shall define steady state operating conditions for response rate and/or output voltage malfunction monitoring that are representative of typical in-use operation, and which will result in the routine execution and completion of the diagnostics in-use. The monitoring system shall operate at least once per operating cycle during which the engine manufacturer-defined monitoring conditions are met.

(iv) For heated oxygen sensors, the engine manufacturer shall define appropriate operating conditions for malfunction monitoring of the heater circuit that are representative of typical in-use operation, and which will result in the routine execution and completion of the diagnostic in-use. The monitoring system shall operate at least once per operating cycle during which the engine manufacturer-defined monitoring conditions are met.

(D) Malfunction notification and diagnostic trouble code storage: Upon detection of any oxygen sensor malfunction, the diagnostic system shall store a diagnostic trouble code and the audio/visual alert device shall activate no later than the end of the next operating cycle during which monitoring occurs provided the malfunction is again present.

(E) Other (non-Lambda) oxygen sensors:

(i) For engines equipped with universal exhaust gas oxygen sensors (i.e., sensors which provide an output proportional to exhaust gas oxygen concentration), the engine manufacturer shall define steady state operating conditions as in paragraph (b)(4)(C)(i) above for the diagnostic system to perform a response rate check (the time required to respond to a specific change in fuel/air ratio) that are representative of typical in-use operation, and which will result in the routine execution and completion of all IMDN diagnostics in-use. The monitoring system shall operate at least once per operating cycle during which the engine manufacturer-defined monitoring conditions are met. The diagnostic system shall also perform an out-of-range check for which monitoring shall be continuous. For malfunctions, audio/visual alert device activation and diagnostic trouble code storage shall be as in paragraph (b)(4)(D).

(ii) If an engine manufacturer utilizes other types of oxygen sensors, the engine manufacturer shall submit a monitoring plan to the Executive Officer for approval based on equivalent monitoring with conventional sensors.

(5) Comprehensive component monitoring.

(A) Purpose and scope: The diagnostic system shall monitor for malfunction any electronic engine component/system not otherwise described above which either provides input to (directly or indirectly), or receives commands from the on-board computer, and which: (1) can affect emissions during any reasonable in-use driving condition, or (2) is used as part of the diagnostic strategy for any other monitored system or component.

(i) Input components:

a. The monitoring system shall have the capability of detecting, **at a minimum**, lack of circuit continuity **and out of range values to ensure proper operation of the input device. The determination of out of range values shall**

include logic evaluation of available information to determine if a component is operating within its normal range (e.g., a low throttle position sensor voltage would not be reasonable at a high engine speed with a high mass airflow sensor reading). To the extent feasible, said logic evaluation shall be “two-sided” (i.e., verify a sensor output is not inappropriately high or low).

b. Input components may include, but are not limited to, the engine speed sensor, crank angle sensor, knock sensor, throttle position sensor, coolant temperature sensor, cam position sensor, and other electronic components such as sensors, modules, and solenoids which provide signals to the engine control system (see paragraph (b)(5)(E)).

c. The coolant temperature sensor shall be monitored for achieving a stabilized minimum temperature level that is needed to achieve closed-loop operation within an engine manufacturer-specified time interval after starting the engine. The time interval shall be a function of starting engine coolant temperature and/or a function of intake air temperature. Engine manufacturers may suspend or delay the diagnostic if the engine is subjected to conditions which could lead to false diagnosis (e.g., engine operation at idle for more than 50 to 75 percent of the warm-up time). Engine manufacturers shall provide data to support specified times. The Executive Officer shall allow disablement of this check under extremely low ambient temperature conditions (below 20 degrees Fahrenheit) provided an engine manufacturer submits data and/or an engineering evaluation that adequately demonstrate non-attainment of a stabilized minimum temperature.

(ii) Output components:

a. The diagnostic system shall monitor output components for proper functional response to computer commands.

b. Components for which functional monitoring is not feasible shall be monitored, at a minimum, for proper circuit continuity and out of range values, if applicable.

c. Output components may include, but are not limited to, the automatic idle speed motor, emission-related electronic solenoids, heated fuel preparation systems, and a warm-up catalyst bypass valve (see paragraph (b)(5)(E)).

(B) Malfunction criteria:

(i) Input components: Input components/systems shall be considered malfunctioning when, **at a minimum**, lack of circuit continuity **or engine manufacturer-specified out-of-range values** occur.

(ii) Output components:

a. **Output components/systems shall be considered malfunctioning when proper functional response to computer commands does not occur. Should a functional check for malfunction not be feasible, then an** output component/system shall be considered malfunctioning when, **at a minimum**, lack of circuit continuity **or engine manufacturer-specified out-of-range values** occurs.

b. **The idle speed control motor/valve shall be monitored for proper functional response to computer commands. For strategies based on deviation from target idle speed, a fault shall be indicated when the idle speed control system cannot achieve the target idle speed within an engine manufacturer specified time and engine speed tolerance. In general, the engine speed tolerances shall not exceed 200 rpm above the target speed or 100 rpm below the target speed. The Executive Officer shall allow larger engine speed tolerances provided an engine manufacturer submits data and/or an engineering evaluation which adequately demonstrate that the tolerances can be exceeded without a malfunction present.**

(C) Monitoring conditions:

(i) Input components: Input components shall be monitored continuously for **proper range of values and** circuit continuity. **For rationality monitoring (where applicable), engine manufacturers shall define appropriate operating conditions that are representative of typical in-use operation and will result in the routine execution and completion of all**

**diagnostics in-use. Rationality monitoring shall occur at least once per operating cycle during which the engine manufacturer-defined monitoring conditions are met.**

**(ii) Output components: Monitoring for circuit continuity and proper range of values (if applicable) shall be conducted continuously. For functional monitoring, engine manufacturers shall define appropriate operating conditions that are representative of typical in-use operation and will result in the routine execution and completion of all diagnostics in-use. Functional monitoring shall occur at least once per operating cycle during which the engine manufacturer-defined monitoring conditions are met.**

(D) Malfunction notification and diagnostic trouble code storage:

(i) Upon detecting a malfunction, the diagnostic system shall store a diagnostic trouble code no later than the end of the next operating cycle during which monitoring occurs provided the malfunction is again detected.

(ii) In conjunction with storing a diagnostic trouble code, engine manufacturers shall activate the audio/visual alert device for malfunctions of components/systems for which either of the following occurs:

a. when malfunctioning, the component or system could cause engine emissions to increase by 15 percent or more of the HC+NO<sub>x</sub> standard, or

b. the component/system is used as part of the diagnostic strategy for any other monitored system or component.

(E) Component determination: The engine manufacturer shall determine whether an engine input or output component not otherwise covered can affect emissions. If the Executive Officer reasonably believes that an engine manufacturer has incorrectly determined that a component cannot affect emissions, the Executive Officer shall require the engine manufacturer to provide emission data showing that such a component, when faulty and installed in a suitable test engine, does not have an emission effect. Emission data may be requested for any reasonable driving condition.

(c) Additional audio/visual alert device activation and diagnostic trouble code storage protocol.

(1) Audio/visual alert device activation: For all emission-related components/systems, upon final determination of malfunction, the audio/visual alert device shall remain continuously activated **(except that it shall activate at one-second intervals as indicated previously for misfire detection)**. If any malfunctions are identified in addition to misfire, the misfire condition shall take precedence, and the audio/visual alert device shall activate at one-second intervals accordingly. The diagnostic system shall store a diagnostic trouble code whenever the audio/visual alert device is activated. The diagnostic system shall activate the audio/visual alert device and shall store a diagnostic trouble code whenever the engine enters a default or "limp home" mode of operation. The diagnostic system shall activate the audio/visual alert device and shall store a diagnostic trouble code whenever the engine control system fails to enter closed-loop operation (if employed) within an engine manufacturer specified minimum time interval.

(2) Audio/visual alert device deactivation:

(A) **Misfire and Fuel System Malfunctions:** For **misfire or fuel** system malfunctions, the audio/visual alert device may be deactivated if the fault does not recur when monitored during three subsequent sequential operating cycles in which conditions are similar to those under which the malfunction was first determined (see paragraphs (b)(2)(D)(iii) and (b)(3)(D)(iii)).

(B) All Other Malfunctions: For all other faults, the audio/visual alert device may be deactivated after three subsequent sequential operating cycles during which the monitoring system responsible for activating the audio/visual alert device functions without detecting the malfunction and if no other malfunction has been identified that would independently activate the audio/visual alert device according to the requirements outlined above.

(3) Erasing a diagnostic trouble code: The diagnostic system may erase a diagnostic trouble code if the same fault is not re-registered in at least 40 engine warm-up cycles, and the audio/visual alert device is not activated for that diagnostic trouble code.

(d) Tampering protection: Computer-coded engine operating parameters shall not be changeable without the use of specialized tools and procedures (e.g. soldered or potted computer components or sealed (or soldered) computer enclosures). Subject to Executive Officer approval, engine manufacturers may exempt from this requirement those product



lines that are unlikely to require protection. Criteria to be evaluated in making an exemption include, but are not limited to, current availability of performance chips, high performance capability of the engine, and sales volume.

(e) Readiness/Function code: The on-board computer shall store a code upon first completing a full diagnostic check (i.e., the minimum number of checks necessary for audio/visual alert device activation) of all monitored components and systems (except as noted below) since the computer memory was last cleared (i.e., through the use of a scan tool or battery disconnect). The code shall be stored in the format specified by SAE J1979, September 1997, or alternatively as specified in ISO 15765-4, November 1999, and ISO 15031-5, December 1999. These documents are incorporated by reference in paragraphs (i)(2) and (i)(5). The diagnostic system check for comprehensive component monitoring and continuous monitoring of **misfire and** fuel system faults shall be considered complete for purposes of determining the readiness indication if malfunctions are not detected in these areas by the time all other diagnostic system checks are complete. Subject to Executive Officer approval, if monitoring is disabled for a multiple number of operating cycles due to the continued presence of extreme operating conditions (e.g., cold ambient temperatures, high altitudes, etc.), readiness for the subject monitoring system may be set without monitoring having been completed. Executive Officer approval shall be based on the conditions for monitoring system disablement and the number of operating cycles specified without completion of monitoring before readiness is indicated.

(f) Stored engine conditions: Upon detection of the first malfunction of any component or system, "freeze frame" engine conditions present at the time shall be stored in computer memory. Should a subsequent fuel system or misfire malfunction occur, any previously stored freeze frame conditions shall be replaced by the fuel system or misfire conditions (whichever occurs first). Stored engine conditions shall include, but are not limited to, calculated load value, engine rpm, fuel trim value(s) (if available), fuel pressure (if available), engine speed (if available), coolant temperature, intake manifold pressure (if available), closed- or open-loop operation (if available), and the diagnostic trouble code which caused the data to be stored. The engine manufacturer shall choose the most appropriate set of conditions facilitating effective repairs for freeze frame storage. Only one frame of data is required. Engine manufacturers may at their discretion choose to store additional frames provided that at least the required frame can be read by a generic scan tool meeting SAE specifications established

in SAE J1978, Recommended Practices on "OBD II Scan Tool," February 1998, and SAE J1979, "E/E Diagnostic Test Modes," September 1997, which are incorporated by reference herein. If the diagnostic trouble code causing the conditions to be stored is erased in accordance with paragraph (c)(3), the stored engine conditions may be cleared as well.

(g) Certification documentation: The engine manufacturer shall submit the following documentation for each engine family at the time of certification. With Executive Officer approval, one or more of the documentation requirements specified in this section may be waived or altered if the information required would be redundant or unnecessarily burdensome to generate:

(1) A written description of the functional operation of each monitoring strategy within the diagnostic system.

(2) A table providing the following information for each monitored component or system (either computer-sensed or -controlled) of the emission control system:

(A) corresponding diagnostic trouble code

(B) monitoring method or procedure for malfunction detection

(C) primary malfunction detection parameter and its type of output signal

(D) fault criteria limits used to evaluate output signal of primary parameter

(E) other monitored secondary parameters and conditions (in engineering units) necessary for malfunction detection.

(F) monitoring time length and frequency of checks.

(G) criteria for storing diagnostic trouble code

(H) criteria for activating the audio/visual alert device

(I) criteria used for determining out of range values and input component rationality checks

(3) A logic flowchart describing the general method of detecting malfunctions for each monitored emission-related component or system. To the extent possible, abbreviations in SAE J1930 "Electrical/Electronic

Systems Diagnostic Terms, Definitions, Abbreviations, and Acronyms,” May 1998, shall be used. J1930 is incorporated by reference herein. The information required in the chart under (2) above may instead be included in this flow chart, provided all of the information required in (2) is included.

(4) A listing and block diagram of the input parameters used to calculate or determine calculated load values and the input parameters used to calculate or determine fuel trim values.

(5) A scale drawing of the audio/visual alert device specifying location in the instrument panel, wording, color, and intensity.

**(6) Data supporting the selected degree of misfire which can be tolerated without damaging the catalyst. Representative data demonstrating the capability of the misfire monitoring system (i.e., probability of detection of misfire events) to detect misfire over the full engine speed and load operating range for selected misfire patterns (i.e., random cylinders, one cylinder out, paired cylinders out).**

(7) Data supporting the limit for the time between engine starting and attaining the designated heating temperature for artificially heated catalyst systems.

(8) Data supporting the criteria used to indicate a malfunction when catalyst deterioration causes emissions to exceed the applicable HC+NO<sub>x</sub> threshold specified in paragraph (b)(1)(B)(i).

(9) If applicable, data supporting the criteria used by the diagnostic system for establishing a 60 to 80 percent catalyst efficiency level to determine a malfunction in accordance with paragraph (b)(1)(B)(ii).

(10) A listing of all electronic engine input and output signals.

(11) Any other information determined by the Executive Officer to be necessary to demonstrate compliance with the requirements of this section.

(h) Confirmatory testing: The ARB may perform confirmatory testing of engine manufacturers’ diagnostic systems for compliance with requirements of this section in accordance with malfunction criteria submitted in the engine manufacturer’s approved certification documentation. The ARB or its designee may install appropriately deteriorated or malfunctioning components in an otherwise properly functioning test engine (or simulate a deteriorated or malfunctioning component response) in order to test the fuel system, **misfire detection system**, oxygen sensor, and catalyst efficiency system monitors for

compliance with the applicable emission constraints in this section. Diagnostic systems of a representative sample of engines that uniformly fail to meet the requirements of this section may be recalled for correction.

(i) Standardization: Standardized access to emission-related diagnostic trouble codes, emission-related engine test information (i.e., parameter values) as outlined in subsection (j), emission related diagnostic procedures, and stored freeze frame data shall be incorporated based on the industry specifications referenced in this regulation.

(1) Either SAE Recommended Practice J1850, "Class B Data Communication Network Interface", March 1998, or ISO 9141-2, "Road engines - Diagnostic Systems - CARB Requirements for Interchange of Digital Information," February 1994, or ISO 14230-4, "Road engines - Diagnostic systems - KWP 2000 requirements for Emission-related systems," April 1996, which are incorporated by reference, shall be used as the on-board to off-board network communications protocol. All SAE J1979 emission related messages sent to the J1978 scan tool over a J1850 data link shall use the Cyclic Redundancy Check and the three-byte header, and shall not use inter-byte separation or checksums.

(2) (A) J1978 & J1979: Standardization of the message content (including test modes and test messages) as well as standardization of the downloading protocol for diagnostic trouble codes, parameter values and their units, and freeze frame data are set forth in SAE J1978, Recommended Practices on "OBD II Scan Tool," February 1998, and SAE J1979, "E/E Diagnostic Test Modes," September 1997, which have been incorporated by reference. Diagnostic trouble codes, parameter values, and freeze frame data shall be capable of being downloaded to a generic scan tool meeting these SAE specifications.

(B) The J1978 scan tool shall be capable of notifying the user when one or more of the required monitoring systems are not included as part of the IMDN system.

(3) J2012 Part C: Uniform diagnostic trouble codes based on SAE specifications shall be employed. SAE J 2012, "Recommended Format and Messages for Diagnostic Trouble Codes," October 1996, is incorporated by reference.

(4) J1962: A standard data link connector in each engine shall be incorporated. The location of the connector shall be easily identified by a technician viewing the engine from above. Any pins in the standard connector that provide any electrical power shall be properly fused to protect the integrity and usefulness of the diagnostic connector for diagnostic purposes. The SAE J1962 Recommended Practice "Diagnostic Connector," February 1998, is incorporated by reference.

(i) Signal access.

(1) The following signals in addition to the required freeze frame information shall be made available on demand through the serial port on the standardized data link connector: calculated load value, diagnostic trouble codes, engine coolant temperature (if available), fuel control system status (open loop, closed loop, other; if equipped with closed loop fuel control), fuel trim (if equipped), fuel pressure (if available), ignition timing advance (if equipped), intake air temperature (if equipped), manifold air pressure (if equipped), air flow rate from mass air flow meter (if equipped), engine rpm, throttle position sensor output value (if equipped), and engine speed (if equipped). The signals shall be provided in standard units based on the SAE specifications incorporated by reference in this regulation, and actual signals shall be clearly identified separately from default value or limp home signals.

(2) Oxygen sensor data (including current oxygen sensor output voltages) allowing the diagnosis of malfunctioning oxygen sensors shall be provided through serial data port on the standardized data link. In addition, for all monitored components and systems, except misfire detection, fuel system monitoring, and comprehensive component monitoring, results of the most recent test performed by the engine, and the limits to which the system is compared shall be available through the data link. For the monitored components and systems excepted above, a pass/fail indication for the most recent test results shall be available through the data link. Such data shall be transmitted in accordance with SAE J1979 (or SAE J1939, whichever applies). Engine manufacturers shall report the test results such that properly functioning systems do not indicate a failure (e.g., a test value that is outside of the test limits). Alternative methods shall be approved by the Executive Officer if, in the judgment of the Executive Officer, they provide for equivalent off-board evaluation.

**(3) Calibration Verification Number: Engine manufacturers shall provide for verification of the on-board computer software integrity in electronically reprogrammable control units through the standardized engine data connector in a standardized format to be adopted by SAE. Such verification shall be capable of being used to determine if the emission-related software and/or calibration data are valid and applicable for that engine.**

(k) Implementation schedule.

(1) These OBD-M requirements, unless otherwise specified, shall be implemented beginning with the 2007 model year.

(2) All engine manufacturers shall meet these requirements by the 2009 model year.

(3) The Executive Officer, upon receipt of an application from the engine manufacturer, may certify the engines in question even though said engines may not comply with one or more of the requirements of these subsections. Such certification is contingent upon the extent to which these requirements are satisfied overall on the engine applications in question and a demonstrated good-faith effort to meet these requirements in full by evaluating and considering the best available monitoring technology. Each incident of non-compliance will be recorded as a deficiency.

(A) Engine manufacturers of non-complying systems shall be subject to fines pursuant to section 43016 of the California Health and Safety Code for each deficiency identified subject to the following limitations:

(i) The specified fines shall apply to the second and subsequently identified deficiencies, with the exception that fines shall apply to all monitoring system deficiencies wherein a required monitoring strategy is completely absent from the IMDN system; and

(ii) Engine manufacturers may not carry over monitoring system deficiencies for more than two model years unless it can be adequately demonstrated that substantial engine hardware modifications and additional lead time beyond two years would be necessary to correct the deficiency, in which case the deficiency may be carried over for three model years.

(B) For the second deficiency and every deficiency thereafter identified in an engine model, the fines shall be in the amount of \$50 per deficiency per engine for non-compliance with any of the

monitoring requirements specified in subsections (b)(1) through (b)(4), and \$25 per deficiency per engine for non-compliance with any other requirement. In determining the identified order of deficiencies, deficiencies of subsections (b)(1) through (b)(4) shall be identified first. Total fines per engine under this section shall not exceed \$500 per engine and shall be payable to the State Treasurer for deposit in the Air Pollution Control Fund.

NOTE: Authority cited: Sections 39515, 39600, 39601, 43006, 43013, 43018, 43104, and 44036.2, Health and Safety Code; Sections 27156 and 38395 Engine Code.

Reference: Sections 39002, 39003, 39667, 43000, 43004, 43006, 43008.6, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43204, and 44036.2, Health and Safety Code; Sections 27156, 38391, and 38395, Engine Code.

#### **§ 2445.1. Defects Warranty Requirements for Model Year 2001 and Later Spark-Ignition Marine Engines.**

(a) Applicability. This section applies to model year 2001 and later spark-ignition personal watercraft and outboard marine engines, and to model year 2003 and later spark-ignition inboard and sterndrive marine engines. The warranty period begins on the date the engine or equipment is delivered to an ultimate purchaser or first placed into service (e.g., a demonstration engine or watercraft).

(b) General Emissions Warranty Coverage. The manufacturer of each spark-ignition marine engine must warrant to the ultimate purchaser and each subsequent purchaser that the engine is:

(1) Designed, built and equipped so as to conform with all applicable regulations adopted by the Air Resources Board pursuant to its authority in Chapters 1 and 2, Part 5, Division 26 of the Health and Safety Code; and

(2) Free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to that part as described in the engine manufacturer's application for certification.

(c) Warranty Period. In the case of all new, spark-ignition marine engines, the warranty period will be:

(1) For model year 2001 and later spark-ignition personal watercraft and outboard marine engines, a period of 4 years or 250 hours of use, whichever occurs first.

(2) For model year 2003-2008 spark-ignition inboard and sterndrive marine engines, a period of 2 years.

(3) For model year 2009 and later spark-ignition inboard and sterndrive marine engines, a period of 3 years.

(d) Subject to the conditions and exclusions of Subsection (g), the warranty on emission-related parts is as follows:

(1) Any warranted part that is not scheduled for replacement as required maintenance in the written instructions required by Subsection (f) must be warranted for the warranty period defined in Subsection (c). If the part fails during the period of warranty coverage, the part must be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under warranty must be warranted for the remainder of the period.

(2) Any warranted part that is scheduled only for regular inspection in the written instructions required by Subsection (f) must be warranted for the warranty period defined in Subsection (c). A statement in such written instructions to the effect of "repair and replace as necessary" will not reduce the period of warranty coverage. Any such part repaired or replaced under warranty must be warranted for the remaining warranty period.

(3) Any warranted part that is scheduled for replacement as required maintenance in the written instructions required by Subsection (f) must be warranted for the period of time before the first scheduled replacement date for that part. If the part fails before the first scheduled replacement, the part must be repaired or replaced by the engine manufacturer according to Subsection (4) below. Any such part repaired or replaced under warranty must be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

(4) Repair or replacement of any warranted part under the warranty provisions of this article must be performed at a warranty station at no charge to the owner.

(5) Notwithstanding the provisions of Subsection (4), warranty services or repairs must be provided at all engine manufacturer distribution centers that are franchised to service the subject engines.



(6) The engine owner must not be charged for diagnostic labor that is directly associated with diagnosis of a defective, emission-related warranted part, provided that such diagnostic work is performed at a warranty station.

(7) The engine manufacturer is liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.

(8) Throughout the engine's warranty period defined in Subsection (c), the engine manufacturer must maintain a supply of warranted parts sufficient to meet the expected demand for such parts.

(9) Any replacement part may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of the engine manufacturer.

(10) Add-on or modified parts, as defined in Section 1900(b)(1) and (b)(10), Title 13, that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claim made in accordance with this article. The engine manufacturer will not be liable under this article to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

(11) The Executive Officer may request and, in such case, the engine manufacturer must provide, any documents that describe that engine manufacturer's warranty procedures or policies.

(e) Each engine manufacturer must provide a copy of the following emission warranty parts list with each new engine, using those portions of the list applicable to the engine.

(1) Fuel Metering System

- (A) Carburetor and internal parts (and/or pressure regulator or fuel injection system)
- (B) Air/fuel ratio feedback and control system
- (C) Cold start enrichment system
- (D) Intake valve(s)

- (2) Air Induction System
  - (A) Controlled hot air intake system
  - (B) Intake manifold
  - (C) Air filter
  - (D) Turbocharger systems
  - (E) Heat riser valve and assembly
- (3) Ignition System
  - (A) Spark plugs
  - (B) Magneto or electronic ignition system
  - (C) Spark advance/retard system
  - (D) Ignition coil and/or control module
  - (E) Ignition wires
- (4) Lubrication System
  - (A) Oil pump and internal parts
  - (B) Oil injector(s)
  - (C) Oil meter
- (5) Positive Crankcase Ventilation (PCV) System
  - (A) PCV valve
  - (B) Oil filler cap
- (6) Exhaust Gas Recirculation (EGR) System
  - (A) EGR valve body, and carburetor spacer if applicable
  - (B) EGR rate feedback and control system
- (7) Air Injection System
  - (A) Air pump or pulse valve
  - (B) Valves affecting distribution of flow
  - (C) Distribution manifold
- (8) Exhaust System
- (9) Catalyst or Thermal Reactor System
  - (A) Catalytic converter
  - (B) Thermal reactor
  - (C) Exhaust manifold
  - (D) Exhaust valve(s)

(10) Miscellaneous Items Used in Above Systems

- (A) Hoses, clamps, fittings, tubing, sealing gaskets or devices, and mounting hardware
- (B) Pulleys, belts and idlers
- (C) Vacuum, temperature, check, and time sensitive valves and switches
- (D) Electronic Controls

(f) Each engine manufacturer must provide with each new engine written instructions for the maintenance and use of the engine by the owner. The instructions must be consistent with this Article. A copy of the instructions for each engine family must be provided to the Executive Officer upon commencement of its production.

(g) Exclusions.

(1) The repair or replacement of any warranted part otherwise eligible for warranty coverage under Subsection (d) may be excluded from such warranty coverage if the engine manufacturer demonstrates that the engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for repair or replacement of the part.

(2) Engine manufacturers must warrant engines for the yearly warranty period specified in paragraph (c). For Outboard and Personal Watercraft engines, manufacturers may warrant engines for the hour warranty period if unless the engines:

- (A) are equipped with hour meters;
- (B) are equipped with devices similar to hour meters that are approved by the Executive Officer; or
- (C) are or will be accompanied by other evidence or methods that the Executive Officer determines reliable for determining engine usage in hours.

(3) Except as provided in Subsection (1) above, any adjustment of a component that has a factory installed, and properly operating, adjustment limiting device (such as an idle limiter cap or plug) is eligible for warranty coverage under Subsection (d).

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

## **§ 2445.2. Emission Control Warranty Statements.**

(a) Each engine manufacturer must provide a verbatim copy of the following statement with each new 2001 model year and later spark-ignition personal watercraft and outboard marine engine and with each new 2003 model year and later spark-ignition inboard and sterndrive marine engine, using those portions of the statement applicable to the engine.

### **CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS**

The California Air Resources Board (and engine manufacturer's name, optional) is (are) pleased to explain the emission control system warranty on your (model year) (inboard, sterndrive, outboard or personal watercraft) engine. In California, new (inboard, sterndrive, outboard, or personal watercraft) engines must be designed, built and equipped to meet the State's stringent anti-smog standards. (Engine manufacturer's name) must warrant the emission control system on your (inboard, sterndrive, outboard, or personal watercraft) engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your (inboard, sterndrive, outboard, or personal watercraft) engine.

Your emission control system may include parts such as the carburetor or fuel injection system, the ignition system, and catalytic converter. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, (engine manufacturer's name) will repair your (inboard, sterndrive, outboard, or personal watercraft) engine at no cost to you, including diagnosis, parts and labor.

### **MANUFACTURER'S WARRANTY COVERAGE:**

(For spark-ignition personal watercraft and outboard marine engines:) Select emission control parts from model year 2001 and later (outboard, or personal watercraft) engines are warranted for 4 years, or for 250 hours of use, whichever occurs first.

(For 2003-2008 spark-ignition inboard and sterndrive marine engines:) Select emission control parts from model year 2003-2008 (inboard or sterndrive) engines are warranted for 2 years.

(For 2009 and later spark-ignition inboard and sterndrive marine engines:) Select emission control parts from model year 2009 and later (inboard or sterndrive) engines are warranted for 3 years.

However, warranty coverage based on the hourly period is only permitted for outboard engines and personal watercraft equipped with appropriate hour meters or their equivalent. If any emission-related part on your engine is defective under warranty, the part will be repaired or replaced by (engine manufacturer's name).

#### **OWNER'S WARRANTY RESPONSIBILITIES:**

– As the (inboard, sterndrive, outboard, or personal watercraft) engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. (Engine manufacturer's name) recommends that you retain all receipts covering maintenance on your (inboard, sterndrive, outboard, or personal watercraft) engine, but (engine manufacturer's name) cannot deny warranty solely for the lack of receipts or your failure to ensure the performance of all scheduled maintenance.

– As the (inboard, sterndrive, outboard, or personal watercraft) engine owner, you should however be aware that (engine manufacturer's name) may deny you warranty coverage if your (inboard, sterndrive, outboard, or personal watercraft) engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

– You are responsible for presenting your (inboard, sterndrive, outboard, or personal watercraft) engine to a (engine manufacturer's name) distribution center as soon as a problem exists. The warranty repairs will be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact (Insert chosen contact of engine manufacturer) at 1-XXX-XXX-XXXX.

(b) Commencing with the 2001 model year, each engine manufacturer must also provide with each new engine a warranty statement in accordance with section 2445.1, Title 13, California Code of Regulations,

that generally describes the obligations and rights of the engine manufacturer and engine owner under this article. Engine manufacturers must also include in the warranty statement a phone number the consumer may use to obtain their nearest franchised service center.

(c) Each engine manufacturer must submit the documents required by Subsections (a) and (b) with the engine manufacturer's application for new engine certification for approval by the Executive Officer. The Executive Officer may reject or require modifications of the documents to the extent the submitted documents do not satisfy the requirements of Subsections (a) and (b). Approval by the Executive Officer of the documents required by Subsections (a) and (b) is a condition of certification. The Executive Officer will approve or disapprove the documents required by Subsections (a) and (b) within ninety (90) days of the date such documents are received from the engine manufacturer. Any disapproval must be accompanied by a statement of reasons therefore. In the event of disapproval, the engine manufacturer may petition the Board to review the decision of the Executive Officer pursuant to Subchapter 1.25 of Title 17, California Code of Regulations.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.

**§ 2446. 2001 and Subsequent Later Model Year Production-Line Test Procedures and Selective Enforcement Auditing Regulations for Spark-Ignition Marine Engines.**

(a) Applicability. This section applies to 2001 and ~~subsequent~~ later spark-ignition marine engines. The allowable methods of production-line testing are specified in paragraphs (b) and (c), unless the engine manufacturer can satisfactorily provide an alternate method that shows an equivalent assurance of compliance to that of paragraph (b). The engine manufacturer must choose only one method for each model year and submit its method of production-line testing to the Executive Officer for approval no later than 90 days prior to the start of the subject model year production. Only subsections (d) and (e) apply to 2003 and later spark-ignition inboard and sterndrive marine engines.

(b) 2001 and ~~Subsequent~~ Later Model Year Quality-Audit Production Line Test Procedures.

(1) Engine Sample Selection.

(A) Except as provided in subsection (b)(2), the engine manufacturer must randomly select one percent of the California sales volume of engines from each engine family for quality-audit testing.

(B) The Executive Officer may, upon notice to the engine manufacturer, require the sample rate to be increased to a maximum of ten percent of production (not to exceed 30 additional engines or units of equipment) of the calendar quarterly production of any engine family.

(2) Alternate Quality-Audit Engine Selection Criteria ~~For~~ 2001 and ~~Subsequent~~ Later Model Years.

(A) An engine manufacturer may use the alternate engine selection method outlined in this Subsection.

(B) Engines or equipment must be randomly selected at a rate of 1.0 percent of engine family production at the beginning of production. When test results of the first 10 engines or units of equipment have been accumulated, an evaluation as indicated below must be made.

(C) Calculate the family mean and standard deviation of HC+NO<sub>x</sub>. Identify engines or units of equipment that have emission levels greater than three standard deviations above the mean. Eliminate these emission data points and recalculate the mean and standard deviation. Continue the calculation until there are no values greater than three standard deviations above the mean. Count the number of these data points greater than the emission standard (outlier). If the total number of outlier is equal to or less than the allowable number in Table 1 for HC + NO<sub>x</sub>, the engine family is eligible to continue to a second evaluation, shown in paragraph (D) below. Otherwise, sampling must continue at a rate of 1.0 percent of production for the rest of the month.

(D) If the allowable outlier criterion is met, the family mean standard deviation, and sample size determined for HC + NO<sub>x</sub> before excluding any outlier, are substituted in the following expression:

$$\frac{(\text{emission standard} - \text{mean}) (N)^{0.5}}{(\text{standard deviation})}$$

(E) If the expression is greater than C in Table 2 below, and the engine manufacturer reasonably estimates that the quarterly engine family production will exceed 5,000 engines or units of equipment, the sampling rate for the remaining portion of the calendar month following the date of selection of the last of the 10 engines or equipment is 10 per month, applied on a prorated basis. If the expression is greater than C in Table 2 below, and the engine manufacturer reasonably estimates that the quarterly engine family production will be 5,000 engines or units of equipment or less, the sampling rate for the remaining portion of the calendar month following the date of selection of the last of the 10 engines or equipment is 5 per month, applied on a prorated basis. If the expression is equal to or less than C in Table 2, the sampling rate continues to be 1.0 percent of production for the remaining portion of the month in which selection of the 10 engines or equipment is completed. The value of C is a function of the coefficient of variation (standard deviation/mean). The coefficient of variation and "C" must be rounded to the number of decimal places shown in Table 2.

Table 1

<i>Sample Size</i>	<i>Allowable Outlier</i>	<i>Sample Size</i>	<i>Allowable Outlier</i>
1-32	1	430-478	11
33-68	2	479-528	12
69-107	3	529-578	13
108-149	4	579-629	14
150-193	5	630-680	15
194-238	6	681-731	16
239-285	7	732-783	17
286-332	8	784-835	18
333-380	9	836-887	19
381-429	10	888-939	20



Table 2

<i>Coefficient of Variation</i>	<i>C</i>
0.1	0.5
0.2	1.2
0.3	1.8
0.4	2.5
0.5	3.1
0.6	3.8
0.7	4.4
0.8	5.1
0.9	5.7

(F) At the conclusion of each month of quarterly engine family production, the emission test data must be evaluated in order to determine the sampling rate as set forth in Paragraphs C and D above. This evaluation must utilize all test data accumulated in the applicable quarter. The sample rate for the next month of production must be determined as follows: ten (10) engines per month when the engine manufacturer's estimated quantity of quarterly engine family production is greater than 5,000; five (5) engines per month when the engine manufacturer's estimated quantity of quarterly engine family production is equal to or less than 5,000; or, one (1) percent of the quarterly engine family production as determined by the sampling evaluation method set forth in Paragraphs D and E.

(G) For each subsequent quarter, the preceding sample selection method must be followed. The sample rate determination for the first month of each subsequent quarter must be based on the accumulated data from the previous quarter. The sample rate for the succeeding months of the quarter must be determined as previously set forth.

(H) If the start of production does not coincide with the first of a quarter, the sequence for sample rate determination must be followed, but references to remaining calendar months may not be appropriate.

(I) Where an engine manufacturer has sampled engines or equipment at a rate of 5 per month following a reasonable estimate that the quarterly engine family production will be 5,000 engines or units of equipment or less, and subsequently determines, or reasonably should determine based on information available to the

engine manufacturer, that the quarterly engine family production will exceed 5,000 engines or units of equipment, the engine manufacturer must increase the sampling rate for the quarter such that the requirements of Paragraph D applicable to families reasonably estimated to exceed a quarterly production of 5,000 engines or units of equipment are satisfied.

(3) Compliance Evaluation.

(A) Each engine manufacturer must review the test results of the first 10 test engines or equipment of each engine family, from each calendar quarter of production or from the start of calendar year production. It must also review the quarter's cumulative test results of each engine family at the end of each month. If 10 or more engines or units of equipment have been tested, the engine manufacturer must notify the Chief of the Mobile Source Operations Division and the Manager of the New Vehicle Audit Section, P.O. Box 8001, 9528 Telstar Avenue, El Monte, CA, 91734-8001, in writing within ten working days whenever an engine family exceeds an emission standard.

(B) At the end of the quarter, all of the data accumulated during the quarter are evaluated, and the compliance of the engine family with the family emission levels or emission standards, whichever is applicable, is determined. If a sample size for a particular production quarter is less than ten engines, the data from that quarter must be combined with all of the data from each successive quarter of the calendar year until data from at least ten engines that have been quality-audit tested are included in the quarterly evaluation. If the sample size for the first quarter's production for a calendar year does not contain at least ten engines, the data available for that quarter are evaluated. However, compliance of the engine family with the family emission levels or emission standards, whichever is applicable, is not determined until subsequent quarterly production data is available that includes evaluations of at least ten engines. If the sample size for the last final quarter's production for a calendar year does not contain at least ten engines, the data from the last final quarter must be combined with all the data from each preceding quarter of the calendar year until the sample size contains at least ten engines.

(C) When the average value of any pollutant that is rounded off to the same number of significant digits as is the standard, in accordance with ASTM E 29-93a, exceeds the applicable family emission level or emission standard, whichever is applicable; or, when the engine manufacturer's submitted data reveal that the

production line tests were performed improperly, the engine family may be determined to be in noncompliance. The Executive Officer will follow the manufacturer notification procedures in section (d)(4).

(D) A failed engine is one whose emission test results for a regulated pollutant exceeds the emission standard or FEL, as applicable.

#### (4) Reports.

(A) Each engine manufacturer shall submit a written report to the ARB within 45 calendar days of the end of each calendar quarter.

(B) The quarterly report shall include the following:

(i) The total production and sample size for each engine family.

(ii) Engine identification numbers and explanation of the identification code.

(iii) The applicable emissions standards or Family Emission Levels for each engine family.

(iv) A description of each test engine or equipment (i.e., date of test, engine family, engine size, engine or equipment identification number, fuel system, dynamometer power absorber setting in horsepower or kilowatts, engine code or calibration number, and test location).

(v) The exhaust emission data for HC+NO<sub>x</sub> for each test engine or equipment. The data reported shall provide two significant figures beyond the number of significant figures in the applicable emission standard.

(vi) The retest emissions data, as described in Paragraph (v) above for any engine or unit of equipment failing the initial test, and description of the corrective measures taken, including specific components replaced or adjusted.

(vii) A statistical analysis of the quality-audit test results for each engine family stating:

1. Number of engines or units of equipment tested.

2. Average emissions and standard deviations of the sample for HC+NO<sub>x</sub>.

(viii) Every aborted test data and reason for the aborted test.

(ix) The applicable quarterly report shall include the date of the end of the engine manufacturer's model year production for an engine family.

(x) The required information for all engine families in production during the quarter regardless of sample size.

(xi) The start and stop dates of batch-produced engine family production.

(C) Each engine manufacturer shall submit a copy of the report that has been stored (e.g., computer disc), or may be transmitted, in an electronically digitized manner, and in a format that is specified by the Executive Officer. This electronically based submission is in addition to the written submission of the report.

(c) 2001 and Later Model Year Cumulative Sum Production-Line Test Procedures.

(1) Engine Sample Section.

(A) At the start of each model year, the engine manufacturer will begin to randomly select engines from each engine family with California sales greater than 20 units for production line testing, according to the criteria specified herein.

(i) For newly certified engine families: After two (2) engines are tested, the engine manufacturer will calculate the required sample size for the model year according to the Sample Size Equation in paragraph (c)(1)(B) of this section.

(ii) For carry-over engine families: After one engine is tested, the engine manufacturer must combine the test with the last test result from the previous model year and then calculate the required sample size for the model year according to the Sample Size Equation in paragraph (B) of this section.

(iii) The engines must be representative of the engine manufacturer's California sales. Each engine will be selected from the end of the assembly line. All engine models within the engine family must be included in the sample pool. Each selected engine for quality-audit testing must pass the inspection test, by being equipped with the appropriate emission control systems certified by

the ARB. The procedure for randomly selecting engines or units of equipment must be submitted to the Chief, Mobile Source Operations Division, P.O. Box 8001, 9528 Telstar Avenue, El Monte, CA, 91734-8001, before the start of production for the first year of production.

(iv) ~~(a)~~a. Prior to the beginning of the 2001 model year, if an engine manufacturer cannot provide actual California sales data, it must provide its total production and an estimate of California sales at the end of the model year. The engine manufacturer must also provide supporting material for its estimate.

~~(b)~~b. For the 2001 and later model years, engine manufacturers must provide actual California sales, or other information acceptable to the Executive Officer, including, but not limited to, an estimate based on market analysis and federal production or sales.

(B)(i) Engine manufacturers must calculate the required sample size for the model year for each engine family using the Sample Size Equation below. N is calculated from each test result. The number N indicates the number of tests required for the model year for an engine family. N is recalculated after each test. Test results used to calculate the variables in the Sample Size Equation must be final deteriorated test results as specified in paragraph (c)(3)(C).

$$N = \left[ \frac{(t_{95} * S)}{(x - FEL_{jx})} \right]^2 + 1$$

where:

N	= <u>n</u> Required sample size for the model year.
T <sub>95</sub>	= 95% confidence coefficient. It is dependent on the actual number of tests completed, n, as specified in the table in paragraph (c)(1)(B)(ii) of this section. It defines one-tail, 95% confidence intervals.
FEL <sub>jx</sub>	= Family Emission Limit
ó	= <u>s</u> Actual test sample standard deviation calculated from the following equation:

$$s = \sqrt{\frac{\sum (X_i - x)^2}{n - 1}}$$

where:

$X_i$  = Emission test results for an individual engine  
 $\bar{x}$  = Mean of emission test results of the actual sample  
 $n$  = The actual number of tests completed in an engine family

(ii) Actual Number of Tests ( $n$ ) and 1-tail Confidence Coefficients ( $t_{95}$ ) are listed in Table 3 below:

**Table 3**

N	$T_{95}$	n	$T_{95}$	n	$T_{95}$
2	6.31	12	1.80	22	1.72
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30	1.70
11	1.81	21	1.72		1.645

(iii) An engine manufacturer must distribute the testing of the remaining number of engines needed to meet the required sample size  $N$ , evenly throughout the remainder of the model year.

(iv) After each new test, the required sample size,  $N$ , is recalculated using updated sample means, sample standard deviations and the appropriate 95% confidence coefficient.

(v) An engine manufacturer must continue testing and updating each engine family's sample size calculations according to paragraphs (c)(1)(B)(i) through (c)(1)(B)(iv) of this section until a decision is made to stop testing as described in paragraph (c)(1)(B)(vi) of this section or a noncompliance decision is made pursuant to paragraph (c)(2)(A)(v) of this section.

(vi) If, at any time throughout the model year, the calculated required sample size,  $N$ , for an engine family is less than or equal to the actual sample size,  $n$ , and the sample mean,  $\bar{x}$ , for each

regulated pollutant is less than or equal to the FEL for that pollutant, the engine manufacturer may stop testing that engine family except as required by paragraph (c)(2)(A)(vi).

(vii) If, at any time throughout the model year, the sample mean,  $\bar{x}$ , for any regulated pollutant is greater than the FEL, the engine manufacturer must continue testing that engine family at the appropriate maximum sampling rate.

(viii) The maximum required sample size for an engine family (regardless of the required sample size,  $N$ , as calculated in paragraph (c)(1)(B)(i) of this section) is thirty (30) tests per model year.

(ix) Engine manufacturers may elect to test additional randomly chosen engines. All additional randomly chosen engines tested in accordance with the testing procedures specified in the Test Procedures must be included in the Sample Size and Cumulative Sum equation calculations as defined in paragraphs (c)(1)(B)(i) and (c)(2)(A)(i) of this section, respectively.

(C) The engine manufacturer must produce and assemble the test engines using its normal production and assembly process for engines to be distributed into commerce.

(D) No quality control, testing, or assembly procedures may be used on any test engine or any portion thereof, including parts and subassemblies, that have not been or will not be used during the production and assembly of all other engines of that family, unless the Executive Officer approves the modification.

## (2) Calculation of the Cumulative Sum Statistic.

(A) Each engine manufacturer must review the test results obtained in paragraph (c)(1) using the following procedure:

(i) Engine manufacturers must construct the following Cumulative Sum Equation for each regulated pollutant for each engine family. Test results used to calculate the variables in the Cumulative Sum Equation must be final deteriorated test results as defined in paragraph (c)(3)(C).

$$C_i = \max[0 \text{ or } (C_{i-1} + X_i - (FEL_{jx} + F))]$$

where:

$C_i$	= The current Cumulative Sum statistic
$C_{i-1}$	= The previous Cumulative Sum statistic. Prior to any testing, the Cumulative Sum statistic = 0 (i.e., $C_0 = 0$ )
$X_i$	= The current emission test result for an individual engine
$FEL_{jx}$	= Family Emission Limit
$F$	= $0.25 \times \sigma$

After each test,  $C_i$  is compared to the action limit,  $H$ , the quantity that the Cumulative Sum statistic must exceed, in two (2) consecutive tests, before the engine family may be determined to be in noncompliance for purposes of paragraphs (a)(2)(A)(iv) and (a)(2)(A)(v).

$H$	= The Action Limit. It is $5.0 \times \sigma$ and is a function of the standard deviation, $\sigma$ .
$\sigma$	= <del>is the</del> The sample standard deviation and is recalculated after each test.

(ii) After each engine is tested, the Cumulative Sum statistic must be promptly updated according to the Cumulative Sum Equation in paragraph (c)(2)(A)(i) of this section.

(iii) If, at any time during the model year, an engine manufacturer amends the application for certification for an engine family as specified in Part I, section 28 or 29 of the Test Procedures by performing an engine family modification (i.e., a change such as a running change involving a physical modification to an engine, a change in specification or setting, the addition of a new configuration, or the use of a different deterioration factor), all previous sample size and Cumulative Sum statistic calculations for the model year will remain unchanged.

(iv) A failed engine is one whose final deteriorated test results pursuant to paragraph (c)(3)(C), for a regulated pollutant exceeds the FEL for that pollutant.

(v) An engine family may be determined to be in noncompliance, if, at any time throughout the model year, the Cumulative Sum statistic,  $C_i$ , for a regulated pollutant is greater than the action limit,  $H$ , for two (2) consecutive tests.



(vi) The engine manufacturer must perform a minimum of two tests per engine family per quarter, regardless of whether the conditions of paragraph (c)(1)(B)(vi) have been met. The Executive Officer may waive the requirement of this paragraph if the engine manufacturer does not have a failing engine family in the prior two model years of testing.

(vii) All results from previous quarters of the same model year must be included in the on-going Cumulative Sum analysis, provided that the engine family has not failed (e.g., if three engines of a family were tested in the first quarter, the first test of the second quarter would be considered as the fourth test).

(viii) If the Cumulative Sum analysis indicates that an engine family has failed, the engine manufacturer must notify the Chief of the Mobile Source Operations Division, in writing and by telephone, within ten working days. Corrective action will be taken as noted in paragraph (c)(4)(E).

(ix) If an engine manufacturer performs corrective action on a failed engine family and then resumes production, all previous tests will be void, and Cumulative Sum analysis will begin again with the next test.

(B) Within 45 days after the end of the quarter, or when the Cumulative Sum analysis indicates that a decision has been made, the engine manufacturer must provide all the data accumulated during the quarter.

### (3) Calculation and Reporting of Test Results.

(A) Initial test results are calculated following the applicable test procedure specified in the Test Procedures.

(B) Final test results are calculated by summing the initial test results derived in paragraph (A) for each test engine and dividing by the number of tests conducted on the engine.

(C) The final deteriorated test results for each test engine are calculated by applying the appropriate deterioration factors, derived in the certification process for the engine family, to the final test results, and rounding in accordance with ASTM E29-93a, incorporated by reference herein, to the same number of decimal places contained in the applicable standard expressed to one additional significant figure.

(D) If, at any time during the model year, the Cumulative Sum statistic exceeds the applicable action limit, H, in two (2) consecutive tests, the engine family may be determined to be in noncompliance and the engine manufacturer must notify the Chief of the Mobile Source Operations Division and the Manager of the New Vehicle Audit Section, P.O. Box 8001, 9528 Telstar Avenue, El Monte, CA, 91734-8001, within ten working days of such exceedance by the Cumulative Sum statistic.

(E) Within 45 calendar days of the end of each quarter, each engine manufacturer must submit to the Executive Officer a report that includes the following information:

(i) The location and description of the engine manufacturer's or other's exhaust emission test facilities that were utilized to conduct testing reported pursuant to this section;

(ii) Total production and sample sizes, N and n, for each engine family;

(iii) The applicable emission standards for each engine family;

(iv) A description of the process to obtain engines on a random basis;

(v) A description of the test engines or equipment (i.e., date of test, engine family, engine size, engine or equipment identification number, fuel system, dynamometer power absorber setting in horsepower or kilowatts, engine code or calibration number, and test location);

(vi) The date of the end of the engine manufacturer's model year production for each engine family;

(vii) For each test conducted,

~~(a)~~a. A description of the test engine, including:

~~(1)~~1. Configuration and engine family identification,

~~(2)~~2. Year, make, and build date,

~~(3)~~3. Engine identification number and explanation of the identification code, and

~~(4)~~4. Number of hours of service accumulated on engine prior to testing.

~~(b)~~b. Location where service accumulation was conducted and description of accumulation procedure and schedule;

~~(e)~~c. Test number, date, test procedure used, initial test results before and after rounding, and final test results for all exhaust emission tests, whether valid or invalid, and the reason for invalidation, if applicable;

~~(d)~~d. The exhaust emission data for CO, NO<sub>x</sub> and HC for each test engine or watercraft. The data reported must provide two (2) significant figures beyond the number of significant figures in the applicable emission standard.

~~(e)~~e. The retest emissions data, as described in paragraph ~~(a)(4)(b)(4)(B)(vi)~~ (a)(4)(b)(4)(B)(vi) of this section, for any engine or watercraft failing the initial test, and description of the corrective measures taken, including specific components replaced or adjusted.

~~(f)~~f. A complete description of any adjustment, modification, repair, preparation, maintenance, and/or testing that was performed on the test engine, was not reported pursuant to any other part of this article, and will not be performed on all other production engines;

~~(g)~~g. A Cumulative Sum analysis, as required in paragraph ~~(a)(2)(c)(2)(A)(i)~~ (a)(2)(c)(2)(A)(i) of this section, of the production line test results for each engine family;

~~(h)~~h. Any other information the Executive Officer may request relevant to the determination whether the new engines being manufactured by the engine manufacturer do in fact conform with the regulations with respect to which the Executive Order was issued;

(viii) For each failed engine as defined in paragraph (vii)~~(d)~~d., above, a description of the remedy and test results for all retests;

(ix) Every aborted test data and reason for the aborted test;

(x) The start and stop dates of batch-produced engine family production; and

(xi) The required information for all engine families in production during the quarter regardless of sample size; and

(F) Each engine manufacturer must submit a copy of the report that has been stored (e.g., computer disc), or may be transmitted, in an

electronically digitized manner, and in a format that is specified by the Executive Officer. This electronically based submission is in addition to the written submission of the report.

(d) Test Procedures Applicable to All Production-Line and Selective Enforcement Audit Testing.

(1) Standards and Test Procedures. The emission standards, exhaust sampling and analytical procedures are those specified in Section 2442. The exhaust sampling and analytical procedures are those described in the Test Procedures. An engine is in compliance with the production-line or selective enforcement audit standards and test procedures only when all portions of the production-line or selective enforcement audit test procedures and requirements specified in Part IV of the Test Procedures are fulfilled, except that any adjustable engine parameters must be set to any value or position that is within the range available to the ultimate purchaser.

(2) Air Resources Board (ARB) personnel and mobile laboratories must have access to engine or equipment assembly plants, distribution facilities, and test facilities for the purpose of engine selection, testing, and observation. Scheduling of access must be arranged with the designated engine manufacturer's representative and must not unreasonably disturb normal operations (See section 31 of the Test Procedures).

(3) Engine Preparation and Preconditioning.

(A) No emissions tests may be performed on an engine before the first production line test on that engine.

(B) The engine or watercraft must be tested after the engine manufacturer's recommended break-in period. The engine manufacturer must submit to the Executive Officer the schedule for engine break-in and any changes to the schedule with each quarterly report. This schedule must be adhered to for all production-line or selective enforcement audit testing within an engine family and subgroup or engine family and assembly plant as appropriate.

(C) If an engine or watercraft is shipped to a remote facility for production-line or selective enforcement audit testing, and adjustment or repair is necessary because of such shipment, the engine manufacturer must perform the necessary adjustments or repairs only after the initial test of the engine or watercraft. Engine

manufacturers must report to the Executive Officer in the quarterly report, all adjustments or repairs performed on engines or watercraft prior to each test. In the event a retest is performed, a request may be made to the Executive Officer, within ten days of the production quarter, for permission to substitute the after-repair test results for the original test results. The Executive Officer will either affirm or deny the request by the engine manufacturer within ten working days from receipt of the request.

(D) If an engine manufacturer determines that the emission test results of an engine or watercraft are invalid, the engine or equipment must be retested. Emission results from all tests must be reported. The engine manufacturer must include a detailed report on the reasons for each invalidated test in the quarterly report.

#### (4) Manufacturer Notification of Failure.

(A) The Executive Officer will notify the engine manufacturer that the engine manufacturer may be subject to revocation or suspension of the Executive Order authorizing sales and distribution of the noncompliant engines in the State of California of the noncompliant engines in the State of California pursuant to section 43017 of the Health and Safety Code. Prior to revoking or suspending the Executive Order, or seeking to enjoin an engine manufacturer, the Executive Officer will consider all information provided by the engine manufacturer, and other interested parties, including, but not limited to corrective actions applied to the noncompliant engine family.

(B) The Executive Officer will notify the equipment manufacturer that the equipment manufacturer may be subject to revocation or suspension of the Executive Order or penalized pursuant to section 43017 of the Health and Safety Code. Prior to revoking or suspending the Executive Order, or penalizing an equipment manufacturer, the Executive Officer will consider all information provided by interested parties, including, but not limited to corrective actions applied to the noncompliant engine family.

#### (5) Suspension and Revocation of Executive Orders.

(A) The Executive Order is automatically suspended with respect to any engine failing pursuant to paragraph (b)(3)(D) or (c)(2)(A)(iv) effective from the time that testing of that engine is completed.

(B) The Executive Officer may suspend the Executive Order for an engine family that is determined to be in noncompliance pursuant to paragraph (b)(3)(C) or (c)(2)(A)(v). This suspension will not occur before fifteen (15) days after the engine family is determined to be in noncompliance.

(C) If the results of testing pursuant to these regulations indicate that engines of a particular family produced at one plant of an engine manufacturer do not conform to the regulations with respect to which the Executive Order was issued, the Executive Officer may suspend the Executive Order with respect to that family for engines manufactured by the engine manufacturer at all other plants.

(D) Notwithstanding the fact that engines described in the application for certification may be covered by an Executive Order, the Executive Officer may suspend such Executive Order immediately in whole or in part if the Executive Officer finds any one of the following infractions to be substantial:

(i) The engine manufacturer refuses to comply with any of the requirements of this section.

(ii) The engine manufacturer submits false or incomplete information in any report or information provided to the Executive Officer under this section.

(iii) The engine manufacturer renders inaccurate any test data submitted under this section.

(iv) An ARB enforcement officer is denied the opportunity to conduct activities authorized in this section.

(v) An ARB enforcement officer is unable to conduct activities authorized in paragraph (d)(2) of this section because an engine manufacturer has located its facility in a foreign jurisdiction where local law prohibits those activities.

(E) The Executive Officer will notify the engine manufacturer in writing of any suspension or revocation of an Executive Order in whole or in part. A suspension or revocation is effective upon receipt of the notification or fifteen (15) days from the time an engine family is determined to be in noncompliance pursuant to paragraph (d)(1), except that the Executive Order is immediately suspended with respect to any failed engines as provided for in paragraphs (b)(3)(D) or (c)(2)(iv) of this section.

(F) The Executive Officer may revoke an Executive Order for an engine family after the Executive Order has been suspended pursuant to paragraphs (d)(5)(B) or (C) of this section if the proposed remedy for the nonconformity, as reported by the engine manufacturer to the Executive Officer, is one requiring a design change or changes to the engine and/or emission control system as described in the application for certification of the affected engine family.

(G) Once an Executive Order has been suspended for a failed engine, as provided for in paragraph (d)(5)(A) of this section, the engine manufacturer must take the following actions before the Executive Order is reinstated for that failed engine:

- (i) Remedy the nonconformity;
- (ii) Demonstrate that the engine conforms to its applicable FEL by retesting the engine in accordance with these regulations; and
- (iii) Submit a written report to the Executive Officer, after successful completion of testing on the failed engine, that contains a description of the remedy and test results for each engine in addition to other information that may be required by this part.

(H) Once an Executive Order for a failed engine family has been suspended pursuant to paragraphs (d)(5)(B), (C) or (D) of this section, the engine manufacturer must take the following actions before the Executive Officer will consider reinstating the Executive Order:

- (i) Submit a written report to the Executive Officer that identifies the reason for the noncompliance of the engines, describes the proposed remedy, including a description of any proposed quality control and/or quality assurance measures to be taken by the engine manufacturer to prevent future occurrences of the problem, and states the date on which the remedies will be implemented.
- (ii) Demonstrate that the engine family for which the Executive Order has been suspended does in fact comply with the regulations of paragraphs (b) or (c), as applicable, by testing as many engines as needed so that the Cumulative Sum statistic, as calculated in paragraph (c)(2)(A)(i), falls below the action limit, or the average emissions from the Quality-Audit testing as calculated in paragraph (b)(3)(A) remains below the FEL, as applicable. Such testing must comply with the provisions of paragraphs (b) or (c), as applicable. If the engine manufacturer elects to continue testing individual

engines after suspension of an Executive Order, the Executive Order is reinstated for any engine actually determined to be in conformance with the emission standards through testing in accordance with the applicable test procedures, provided that the Executive Officer has not revoked the Executive Order pursuant to paragraph (d)(5)(F) of this section.

(I) Once the Executive Order has been revoked for an engine family, if the engine manufacturer wants to introduce into commerce a modified version of that family, the following actions must be taken before the Executive Officer may issue an Executive Order for that modified family:

(i) If the Executive Officer determines that the proposed change(s) in engine design may have an effect on emission performance deterioration, the Executive Officer will notify the engine manufacturer, within five (5) working days after receipt of the report in paragraph (d)(5)(H)(i) of this section, whether subsequent testing under this section will be sufficient to evaluate the proposed change or changes or whether additional testing will be required; and

(ii) After implementing the change or changes intended to remedy the nonconformity, the engine manufacturer must demonstrate that the modified engine family does in fact conform with the regulations of paragraphs (b) or (c), as applicable, by testing as many engines as needed from the modified engine family so that the Cumulative Sum statistic, as calculated in paragraph (c)(2)(A)(i), falls below the action limit, or the average emissions from the Quality-Audit testing as calculated in paragraph (b)(3)(A) remains below the FEL, as applicable. When this requirement is met, the Executive Officer will reissue the Executive Order or issue a new Executive Order, as the case may be, to include that family. The revocation of engine family executive orders issued based on Cumulative Sum testing results remains in effect as long as the Cumulative Sum statistic remains above the action limit.

(J) At any time after the suspension of an Executive Order for a test engine under to paragraph (d)(5)(A) of this section, but not later than fifteen (15) days (or such longer period as may be allowed by the Executive Officer) after notification of the Executive Officer's decision to suspend or revoke an Executive Order in whole or in part pursuant to paragraphs (d)(5)(B), (C) or (F) of this section, an engine manufacturer may request a hearing pursuant to subchapter 1.25, Title 17, California Code of Regulations, as to whether the tests have been properly conducted or any sampling methods have been properly applied.



(K) Any suspension of an Executive Order under paragraph (d)(5)(D) of this section:

(i) must be made only after the engine manufacturer concerned has been offered an opportunity for a hearing pursuant to subchapter 1.25, Title 17, California Code of Regulations, and;

(ii) does not apply to engines no longer in the possession of the engine manufacturer.

(L) After the Executive Officer suspends or revokes an Executive Order pursuant to this section and before the commencement of a hearing, if the engine manufacturer demonstrates to the Executive Officer's satisfaction that the decision to suspend or revoke the Executive Order was based on erroneous information, the Executive Officer will reinstate the Executive Order.

(M) To permit an engine manufacturer to avoid storing non-test engines while conducting subsequent testing of the noncomplying family, an engine manufacturer may request that the Executive Officer conditionally reinstate the Executive Order for that family. The Executive Officer may reinstate the Executive Order subject to the following condition: the engine manufacturer must commit to recall all engines of that family produced from the time the Executive Order is conditionally reinstated, and must commit to remedy any nonconformity at no expense to the owner.

(e) Selective Enforcement Auditing Regulations.

(1) Test eOrders.

(A) A test order addressed to the engine manufacturer is required for any testing under paragraph (e).

(B) The test order is signed by the Executive Officer or his or her designee. The test order must be delivered in person by an ARB enforcement officer or ARB authorized representative to a company representative or sent by registered mail, return receipt requested, to the engine manufacturer's representative who signed the application for certification submitted by the engine manufacturer, pursuant to the requirements of the applicable portions of Title 13, California Code of Regulations, section 2447. Upon receipt of a test order, the engine manufacturer must comply with all of the provisions of this subsection and instructions in the test order.

(C) Information included in test order.

(i) The test order will specify the engine family to be selected for testing, the engine manufacturer's engine assembly plant or associated storage facility or port facility (for imported engines) from which the engines must be selected, the time and location at which engines must be selected, and the procedure by which engines of the specified family must be selected. The test order may specify the configuration to be audited and/or the number of engines to be selected per day. Engine manufacturers are required to select a minimum of four engines per day unless an alternate selection procedure is approved pursuant to paragraph (e)(2)(A), or unless total production of the specified configuration is less than four engines per day. If total production of the specified configuration is less than four engines per day, the engine manufacturer selects the actual number of engines produced per day.

(ii) The test order may include alternate families to be selected for testing at the Executive Officer's discretion in the event that engines of the specified family are not available for testing because those engines are not being manufactured during the specified time or are not being stored at the specified assembly plant, associated storage facilities, or port of entry.

(iii) If the specified family is not being manufactured at a rate of at least two (2) engines per day in the case of engine manufacturers specified in paragraph (e)(4)(G)(i) of this section, or one engine per day in the case of engine manufacturers specified in paragraph (e)(4)(G)(ii) of this section, over the expected duration of the audit, the Executive Officer or her or his designated representative may select engines of the alternate family for testing.

(iv) In addition, the test order may include other directions or information essential to the administration of the required testing.

(D) An engine manufacturer may submit a list of engine families and the corresponding assembly plants, associated storage facilities, or (in the case of imported engines) port facilities from which the engine manufacturer prefers to have engines selected for testing in response to a test order. In order that an engine manufacturer's preferred location be considered for inclusion in a test order for a particular engine family, the list must be submitted prior to issuance of the test order. Notwithstanding the fact that an engine manufacturer has submitted the list, the Executive Officer may order selection at other than a preferred location.

(E) Upon receipt of a test order, an engine manufacturer must proceed in accordance with the provisions of paragraph (e).

(2) Testing by the Executive Officer.

(A) The Executive Officer may require by test order under paragraph (e)(1) that engines of a specified family be selected in a manner consistent with the requirements of paragraph (e)(3) and submitted to the Executive Officer at the place designated for the purpose of conducting emission tests. These tests will be conducted in accordance with paragraph (e)(4) to determine whether engines manufactured by the engine manufacturer conform with the regulations with respect to which the certificate of conformity was issued.

(B) Designating official data.

(i) Whenever the Executive Officer conducts a test on a test engine or the Executive Officer and engine manufacturer each conduct a test on the same test engine, the results of the Executive Officer's test are the official data for that engine.

(ii) Whenever the engine manufacturer conducts all tests on a test engine, the engine manufacturer's test data are accepted as the official data, provided that if the Executive Officer makes a determination based on testing conducted under paragraph (e)(2)(A) of this section that there is a substantial lack of agreement between the engine manufacturer's test results and the Executive Officer's test results, no engine manufacturer's test data from the engine manufacturer's test facility will be accepted for purposes of this subsection.

(C) If testing conducted under paragraph (e)(1) is unacceptable under paragraph (B)(ii) of this subsection, the Executive Officer must:

(i) Notify the engine manufacturer in writing of the Executive Officer's determination that the test facility is inappropriate for conducting the tests required by this subsection and the reasons therefor; and

(ii) Reinstate any engine manufacturer's data upon a showing by the engine manufacturer that the data acquired under paragraph (e)(2) were erroneous and the engine manufacturer's data was correct.

(D) The engine manufacturer may request in writing that the Executive Officer reconsider the determination in paragraph (B)(ii) of this section based on data or information indicating that changes have been made to the test facility and these changes have resolved the reasons for disqualification.

(3) Sample selection.

(A) Engines comprising a test sample will be selected at the location and in the manner specified in the test order. If an engine manufacturer determines that the test engines cannot be selected in the manner specified in the test order, an alternative selection procedure may be employed, provided the engine manufacturer requests approval of the alternative procedure before starting test sample selection, and the Executive Officer approves the procedure.

(B) The engine manufacturer must produce and assemble the test engines of the family selected for testing using its normal production and assembly process for engines to be distributed into commerce. If, between the time the engine manufacturer is notified of a test order and the time the engine manufacturer finishes selecting test engines, the engine manufacturer implements any change(s) in its production or assembly processes, including quality control, which may reasonably be expected to affect the emissions of the engines selected, then the engine manufacturer must, during the audit, inform the Executive Officer of such changes. If the test engines are selected at a location where they do not have their operational and emission control systems installed, the test order will specify the manner and location for selection of components to complete assembly of the engines. The engine manufacturer must assemble these components onto the test engines using normal assembly and quality control procedures as documented by the engine manufacturer.

(C) No quality control, testing, or assembly procedures will be used on the test engine or any portion thereof, including parts and subassemblies, that have not been or will not be used during the production and assembly of all other engines of that family, unless the Executive Officer approves the modification in production or assembly procedures pursuant to paragraph (B) of this subsection.

(D) The test order may specify that an ARB enforcement officer(s) or authorized representative(s), rather than the engine manufacturer, select the test engines according to the method specified in the test order.

(E) The order in which test engines are selected determines the order in which test results are to be used in applying the sampling plan in accordance with paragraph (e)(5).

(F) The engine manufacturer must keep on hand all untested engines, if any, comprising the test sample until a pass or fail decision is reached in accordance with paragraph (e)(5)(E). The engine manufacturer may ship any tested engine which has not failed the requirements as set forth in paragraph (e)(5)(B). However, once the engine manufacturer ships any test engine, it may not conduct retests as provided in paragraph (e)(4)(I).

#### (4) Test procedures.

(A)(i) For spark-ignition marine engines subject to the provisions of this subsection, the prescribed test procedures are the test procedures as specified in Part IV of the Test Procedures.

(ii) The Executive Officer may, on the basis of a written application by an engine manufacturer, prescribe test procedures other than those specified in paragraph (i) for any spark-ignition marine engine he or she determines is not susceptible to satisfactory testing using the procedures specified in paragraph (i).

(B)(i) The engine manufacturer may not adjust, repair, prepare, or modify the engines selected for testing and may not perform any emission tests on engines selected for testing pursuant to the test order unless this adjustment, repair, preparation, modification, and/or tests are documented in the engine manufacturer's engine assembly and inspection procedures and are actually performed or unless these adjustments and/ or tests are required or permitted under this subsection or are approved in advance by the Executive Officer.

(ii) The Executive Officer may adjust or cause to be adjusted any engine parameter that the Executive Officer determines subject to adjustment for certification and Selective Enforcement Audit testing in accordance with Part I, section 18 of the Test Procedures, ~~adopted October 21, 1999, and incorporated by reference herein,~~ to any setting within the physically adjustable range of that parameter, as determined by the Executive Officer in accordance with section

18, prior to the performance of any tests. However, if the idle speed parameter is one which the Executive Officer has determined to be subject to adjustment, the Executive Officer may not adjust it to any setting that causes a lower engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter if the engine manufacturer had accumulated 12 hours of service on the engine under paragraph (C) of this section, all other parameters being identically adjusted for the purpose of the comparison. The engine manufacturer may be requested to supply information needed to establish an alternate minimum idle speed. The Executive Officer, in making or specifying these adjustments, may consider the effect of the deviation from the engine manufacturer's recommended setting on emission performance characteristics as well as the likelihood that similar settings will occur on in-use engines. In determining likelihood, the Executive Officer may consider factors such as, but not limited to, the effect of the adjustment on engine performance characteristics and information from similar in-use engines.

(C) Service Accumulation. Before performing exhaust emission testing on a selective enforcement audit test engine, the engine manufacturer may accumulate on each engine a number of hours of service equal to the greater of 12 hours or the number of hours the engine manufacturer accumulated during certification on the emission data engine corresponding to the family specified in the test order.

(i) Service accumulation must be performed in a manner using good engineering judgment to obtain emission results representative of normal production engines. This service accumulation must be consistent with the new engine break-in instructions contained in the applicable owner's manual.

(ii) The engine manufacturer must accumulate service at a minimum rate of 6 hours per engine during each 24-hour period, unless otherwise approved by the Executive Officer.

~~(a)~~a. The first 24-hour period for service begins as soon as authorized checks, inspections, and preparations are completed on each engine.

~~(b)~~b. The minimum service accumulation rate does not apply on weekends or holidays.

~~(e)~~c. If the engine manufacturer's service or target is less than the minimum rate specified (6 hours per day), then the minimum daily accumulation rate is equal to the engine manufacturer's service target.

(iii) Service accumulation must be completed on a sufficient number of test engines during consecutive 24-hour periods to assure that the number of engines tested per day fulfills the requirements of paragraphs (G)(i) and (G)(ii) ~~of this section~~below.

(D) The engine manufacturer may not perform any maintenance on test engines after selection for testing, nor may the Executive Officer allow deletion of any engine from the test sequence, unless requested by the engine manufacturer and approved by the Executive Officer before any engine maintenance or deletion.

(E) The engine manufacturer must expeditiously ship test engines from the point of selection to the test facility. If the test facility is not located at or in close proximity to the point of selection, the engine manufacturer must assure that test engines arrive at the test facility within 24 hours of selection. The Executive Officer may approve more time for shipment based upon a request by the engine manufacturer accompanied by a satisfactory justification.

(F) If an engine cannot complete the service accumulation or an emission test because of a malfunction, the engine manufacturer may request that the Executive Officer authorize either the repair of that engine or its deletion from the test sequence.

(G) Whenever an engine manufacturer conducts testing pursuant to a test order issued under this subsection, the engine manufacturer must notify the Executive Officer within one working day of receipt of the test order as to which test facility will be used to comply with the test order. If no test cells are available at a desired facility, the engine manufacturer must provide alternate testing capability satisfactory to the Executive Officer.

(i) An engine manufacturer with projected spark-ignition marine engine sales for the California market for the applicable year of 20 or greater must complete emission testing at a minimum rate of two (2) engines per 24-hour period, including each voided test.

(ii) An engine manufacturer with projected spark-ignition marine engine sales for the California market for the applicable year of less than 20 must complete emission testing at a minimum rate of one engine per 24-hour period, including each voided test.

(iii) The Executive Officer may approve a lower daily rate of emission testing based upon a request by an engine manufacturer accompanied by a satisfactory justification.

(H) The engine manufacturer must perform test engine selection, shipping, preparation, service accumulation, and testing in such a manner as to assure that the audit is performed in an expeditious manner.

(I) Retesting.

(i) The engine manufacturer may retest any engines tested during a Selective Enforcement Audit once a fail decision for the audit has been reached in accordance with paragraph (e)(5)(E).

(ii) The Executive Officer may approve retesting at other times based upon a request by the engine manufacturer accompanied by a satisfactory justification.

(iii) The engine manufacturer may retest each engine a total of three times. The engine manufacturer must test each engine or vehicle the same number of times. The engine manufacturer may accumulate additional service before conducting a retest, subject to the provisions of paragraph (C) of this paragraph (4).

(J) An engine manufacturer must test engines with the test procedure specified in Part IV of the Test Procedures to demonstrate compliance with the exhaust emission standard (or applicable FEL) for HC+NO<sub>x</sub>. If alternate procedures were used in certification pursuant to Part 1, section 20(c) of the Test Procedures, ~~adopted October 21, 1999 and incorporated by reference herein,~~ then those alternate procedures must be used.

(5) Compliance with acceptable quality level and passing and failing criteria for selective enforcement audits.

(A) The prescribed acceptable quality level is 40 percent.

(B) A failed engine is one whose final test results for HC+NO<sub>x</sub> pursuant to paragraph (b)(3)(D) or (c)(2)(iv), as applicable, exceed the applicable family emission level.

(C) The engine manufacturer must test engines comprising the test sample until a pass or fail decision is reached for HC+NO<sub>x</sub>. A pass decision is reached when the cumulative number of failed engines,



as defined in paragraph (B), for HC+NO<sub>x</sub> is less than or equal to the pass decision number, as defined in paragraph (D), appropriate to the cumulative number of engines tested. A fail decision is reached when the cumulative number of failed engines for HC+NO<sub>x</sub> is greater than or equal to the fail decision number, as defined in paragraph (D), appropriate to the cumulative number of engines tested.

(D) The pass and fail decision numbers associated with the cumulative number of engines tested are determined by using the tables in Appendix A to this subsection (e), "Sampling Plans for Selective Enforcement Auditing of Spark-Ignition Marine Engines," appropriate to the projected sales as made by the engine manufacturer in its report to ARB under paragraph (b)(4) or (c)(3)(A). In the tables in Appendix A to this subsection, sampling plan "Astage" refers to the cumulative number of engines tested. Once a pass or fail decision has been made for HC+NO<sub>x</sub>, the number of engines with final test results exceeding the emission standard for HC+NO<sub>x</sub> shall not be considered any further for the purposes of the audit.

(E) Passing or failing a selective enforcement audit occurs when the decision is made on the last engine required to make a decision under paragraph (C).

(F) The Executive Officer may terminate testing earlier than required in paragraph (C) upon either a manufacturer's or Executive Officer's admission that further testing would not change the pass/fail decision.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43102 and 43104, Health and Safety Code.

Reference: Sections 43013, 43017, 43018, 43101, 43102, 43104, 43105, 43150-43154, 43205.5 and 43210-43212, Health and Safety Code.